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USSR Report

AGRICULTURE

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USSR REPORT

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CONTENTS

HARVESTING SITUATION IN RSFSR REVIEWED

Moscow SOVETSKAYA ROSSIYA in Russian 23 Sep 83 p 1

[Survey prepared by personnel of the RSFSR Ministry of Agriculture: "Harvesting Should Be Complete"; passages in all capital letters appear in boldface in original]

[Text] Early in the second half of September there was dry and warm weather in the European USSR, which immediately affeted the pace of harvesting operations. Columns of trucks laden with potatoes, sugar beets and amber grain corn are advancing toward reception stations.

The harvesting of earcorn was commenced in an organized manner in the Kabardino-Balkar ASSR, where it has been 28 percent completed. This work proceeds at the fastest pace in Mayskiy Rayon, where the harvest, too, has been excellent--nearly 70 quintals per hectare.

In North Osetiya the tone in the competition is set by the mehanized autonomous section of Nikolay Cherevko of Kolkhoz imeni Lenin in Ardonskiy Rayon. On that farm 85-90 quintals of grain are currently being harvested on both irrigated and desert-soil lands.

The LEADERS in corn harvesting are: DAGESTAN ASSR, KABARDINO-BALKAR ASSR, CHECHENO-INGUSH ASSR.

Corn growers in these republics could attain still better reults, but in recent days they have been hampered by delays in the supplies of fuels and lubricants. The stocks accumulated before the harvest season have been depleted, and the heads of agro-industrial associations did not attend promptly to replenishing them.

The largest area planted with corn in the republic [RSFSR] exists in Krasnoyarsk Kray--about 350,000 hectares, of which one-third has alreay been harvested. It is laudable that seed procurements have already been commenced in that kray, and that all the grading plants have joined in the work.

As for crop yields, they are as a rule higher wherever industrialized techniques are employed. In Stavropol Kray this applies to the Kochubeyevskiy, Kirovskiy, Grachevskiy and Novoaleksandrovskiy rayons. These rayons conduct harvesting more competently, too. For the kray as a whole, however, earcorn has so far been havested only from 15,000 hectares. It is a disgrace that elementary oversights hare hobbling the harvesting conveyor.

The LAGGARDS in corn harvesting are: VORONEZH AND ROSTOV OBLASTS.

The situation with procurements of grain corn is particularly bad. This may cause considerable problems to the combined feed industry. So far, Voronezh Oblast has not delivered even one ton of seeds, although it grows early-maturing and middle-early hybrids for which there is a constant and acute demand on the farms of the Non-Chernozem Zone, the Urals and Siberia.

Sugar beets in the republic [RSFSR] occupy more than 1.5 million hectares, and so far 45 percent of their harvesting has been completed (more than 70 percent in Penza Oblast and Mordovian ASSR alone, and more than 60 percent in the Lipetsk and Tambov oblasts alone).

The LEADERS in trucking sugar beets are: SARATOV, PENZA AND ULYANOVSK OBLASTS AND MORDOVIAN ASSR.

The Izobil'venskiy Sugar Plant in Stavropol Kray acted rightly in organizing a special dispatcher service for maintaining regular contacts with all farms and streamlining transport schedules. As a result, the daily "output" carried per truck there has reached 34 tons, compared with an average of 15 tons for the RSFSR as a whole, but there also are oblasts in which this indicator is below 8 tons. Owing to poor performance of transports about 3 million tons of already harvested beets have by now accumulated on the fields. This causes them to deteriorate in quality and sugar content.

The LAGGARDS in trucking sugar beets are: KUYBYSHEV, TAMBOV AND LIPETSK OBLASTS.

Belgorod Oblast beet growers have demonstrated a highly laudable initiative: they perform additional cultivating operations and pick up the beets left behind on the fields by harvesting combines. Records of completed harvesting of each field are kept. This caring attitude toward the harvest has been a major factor in the oblast's reaching the highest yield of sugar beets per hectare in the republic--220 quintals.

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BEET HARVESTING IN CENTRAL RUSSIAN OBLASTS ASSESSED

Moscow SEL'SKAYA ZHIZN' in Russian 7 Oct 83 p 1

[Article by A. Trubnikov, SEL'SKAYA ZHIZN' correspondent: "The Sugar Beet Conveyor"]

[Text] Sugar beet fields in the Belgorod, Kursk and Orel oblasts occupy nearly 400,000 hectares and all are being harvested now. The best results are achieved wherever efficient coordination of the efforts of beet growers, truck drivers and processors has been organized following the example of Yampol'skiy Rayon.

At the "Bol'shevik" Chernyanskiy Kolkhoz in Belgorod Oblast the goal is to obtain 50 quintals of sugar per hectare and, following treatment with the BM-6 machine, the fields are swept with "brooms" in tandem with T-40 tractors, which serve to clean the beets of the residues of top foliage and facilitate the operation of equipment. Owing to a careful adjustment of their RKS-6 and KS-6 combines, the mechanizers V. N. Shishkov, A. P. Krylov, A. I. Voronezhskiy and others harvest the entire crop without losses and dispatch beets to the processing plant without final cleaning by hand.

In Kursk Oblast an example of fruitful collaboration is demonstrated once again this year by the beet growers of the "Zarya kommunizma" Korenevskiy Kolkhoz and the collective of the Sugar Plant imeni Kuybyshev. On that farm 450 quintals of beets are harvested per hectare and dispatched for processing. Other farms, too, have grown a bumper harvest of beets and are adhering to their schedules for harvesting and trucking them.

Orel Oblast farmers try to emulate Livenskiy Rayon, where the pace of the harvesting and trucking of beets is the highest in the oblast. Agro-industrial associations assure an efficient coordination of actions of the partners.

Good results are produced by the autonomous-section system of the organization of labor. In Orel Oblast about 60 percent of the mechanized sections and links (out of a total number of more than 700) operate under the collective contract system, with their pay depending on the end-result. They provide an example of how losses can be avoided. In Glazunovskiy Rayon, for example, replowing of fields and the collection of left-behind beets was organized.

The example provided by the leading rayons, farms, sections and links demonstrates the great possibilities of beet growers and processors for

increasing sugar production sharply this year. But these possibilities are far from fully utilized. In Gubkinskiy and Novooskol'skiy rayons of Belgorod Oblast a gap between the size of the actual harvest and the amount harvested has formed. Losses are sustained wherever attention is not paid to adjusting the implements of beet-harvesting combines, collection of left-behind beets is not organized and proper accounting of the harvested crop is not being kept.

On many farms beets are stored for several days in small mounds and lose weight and sugar content owing to winds and the sun. In Konyshevskiy Rayon, Kursk Oblast, for example, trucks idle owing to frequent breakdowns of loaders and delays in the final cleaning of beets. For the same reason, large quantities of beets still have not been picked up from the fields of the Maloarkhangel'skiy and Pokrovskiy rayons of Orel Oblast. Likewise, trucks are still idled for long intervals of time at beet reception stations. Fairly often, drivers have to wait 2 or 3 hours to unload their trucks at the Kursk Plants imeni K. Liebknecht in Krivetskiy. The drivers of heavy-duty trucks and truck-trailer trains have a special problem: at the Yeropkinskiy Beet Reception Station in Orel Oblast their vehicles are often unloaded by means of...pitchforks!

This unwittingly makes one want to ask the RSFSR Ministry of the Food Industry and the oblast associations of sugar industry when will, finally, the beet reception stations be equipped with reliable unloading facilities and improved servicing? The rayon associations of the "Sel'khoztekhnika" [Agricultural Equipment Association] allocate few spare parts and provide little assistance in organizing maintenance services.

This year the volume of sugar beet procurements is rising markedly. The burden on the processing industry is correspondingly greater. Unfortunately far from all sugar plants operate at full capacity. So far the Valuyskiy Plant in Belgorod Oblast has been fulfilling its daily beet processing targets only a little more than in half.

The performance of farms and rayons is usually evaluated according to the quantity of beets procured. But is not it time also when assessing the results of the competition, to also take into account the end-result--the sugar yield?

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SUGAR BEET TRANSPORT PROBLEMS IN KURSK OBLAST

Moscow SOVETSKAYA ROSSIYA in Russian 22 Sep 83 p 4

[Article by P. Nikitin, SOVETSKAYA ROSSIYA correspondent, Kursk Oblast: "Waiting to be Loaded"]

[Text] The truck drivers whom we met at the sugar beet plantation of the "Iskra" Kolkhoz, L'govskiy Rayon, were ill-humored. They asked the farm management to either organize the operations so as to use their vehicles efficiently or transfer them elsewhere.

Driver V. Levochkin said, frowning: "We make two or three trips a day. What kind of work is that?"

On the other farms, too, many complain about the poor organization of truck hauls. On 17 September 123,000 tons of sugar beets were trucked from the fields of Kursk Oblast. This might seem to be a good indicator. But transport in that oblast is far from being fully utilized. The average "output" per truck is, as a rule, not more than 12-13 tons. The shortcomings are chiefly due to adherence to the old principles and methods of management in the rayons. The importance of the Saratov method for coordinating transport operations is clearly being underestimated.

However, a plaque with the legend "Center for Trucking Operations" can be found in L'govskiy Rayon. But what is behind that plaque? An ordinary team of freight dispatchers which has neither loading facilities nor trucks. Its role reduces to a mere compilation of rayon reports. As for the trucks, they are mostly assigned to kolkhozes and sovkhozes. What is the end-result? At the aforementioned "Iskra" Kolkhoz trucks stand idle, while at the "40 let Oktyabrya" Kolkhoz, conversely, a heavy-duty beet loader is standing idle. At six o'clock in the evening, when we reached the plantation, the equipment operator had already left, seeing that there would be nothing for him to do.

Transport operations in neighboring Kurchatovskiy Rayon are organized in a like manner. There, we were shown figures on the amounts of sugar beets ready to be trucked from the farms. A check-up, however, showed that these figures were far from the truth. The dispatchers reported that 310 tons of beets were being stored in beet pits at the Kolkhoz imeni Thaelmann, but the kolkhoz chairman declared that he has three times as much beets ready to be trucked out.

According to the figures of the trucking operations center, there is not even a quintal of cleaned sugar beets at the "Zarya" Kolkhoz and hence trucks should be absent there. But a personal visit revealed the sight of a group of laborers standing in the middle of the field, at the edge of a beet pit, and throwing beets in a leisurely manner onto the platform of a heavy-duty ZIL truck. The drivers explained: "The 'patrons' from the plant are loading the truck by hand; this is the third truck since the morning." And three more KamAZ trucks, which arrived from Rostov Oblast, were standing and waiting to be loaded.

P. Chefranov, deputy chairman of the Kurchatovskiy Rayon ispolkom, who accompanied me on my visit to that plantation, ordered the transfer of one KamAZ truck to a neighboring farm. But the kolkhoz chairman was unwilling to part with that truck. So much for "coordination."

Quite a few instances of lack of coordination as well as of parochialism, with the farm heads holding on to trucks even when this harms the public interest, have occurred in the Konyshevskiy, Fatezhskiy, Timskiy and Ponyrovskiy rayons, where trucking operations centers exist only on paper. What is more, the average output of the truck drivers who arrived from the other oblasts is markedly below that of the Kursk Oblast drivers. This is because the trucks of the drivers from the other oblasts have been allocated directly to the kolkhozes and sovkhozes.

In places where the Saratov method has been informally introduced the matters are more successful. For example, the productivity of the transport pool operating in the Ol'khovatskaya zone of Shchigrovskiy Rayon is nearly double that of the other zones in that rayon where centralized pickups have not been organized. Driver V. Afanas'yev of the motorized column subordinated to the operations center has already transported 900 tons of sugar beets since the beginning of the current harvest season, and driver V. Shashkov, 1,200 tons. This is more than the total transported by all drivers in Konyshevskiy Rayon on 12 September. Such is the potential of a competent organization of trucking operations. In Kursk Oblast this potential is clearly not being sufficiently exploited.

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MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

GOOD VORONEZH OBLAST BEET HARVEST--Voronezh--A bounteous harvest has been grown by beet growers from the Kolkhoz imeni Kirov in Bogucharskiy Rayon. They fulfilled the yearly plan for sales of beets to the state and made up for the backlog of the last 2 years. Beet harvesting is conducted in an organized manner in the Novousmanskiy, Ramonskiy and Talovskiy rayons. [Text] [Moscow TRUD in Russian 22 Sep 83 p 1] 1386

IVANO-FRANKOVSK OBLAST BEET HARVESTING--Ivano-Frankovsk, 30 [Sep 83] (SEL'SKAYA ZHIZN' correspondent)--The farmers of Galichskiy Rayon are harvesting sugar beets in an organized manner. All beets harvested are immediately transported to the reception stations. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 1 Oct 83 p 1] 1386

IVANO-FRANKOVSK, OREL OBLAST BEET HARVESTS--Ivano-Frankovsk--Most of the mechanized links operating on the basis of the collective contract system on the farms of the Carpathian Piedmonts harvest sugar beets by the continuous-flow method. The best of these links have grown 500 and more quintals of the beets per hectare. Orel-- More than two-thirds of one of the most extensive tracts planted with sugar beets, in the Nonchernozem Zone of Orel Oblast, has been harvested. [Text] [Moscow TRUD in Russian 25 Sep 83 p 1] 1386

OREL OBLAST BEET PROCUREMENTS-- TASS report: "The Contribution of Beet Growers"--Orel--Mechanizers in the Glazunovskiy and Kromskiy rayons of the oblast have started plan-exceeding sales of sugar beets. They operate on the basis of the collective contract system and the beet crop in that oblast is being grown by means of industrialized techniques. Two-thirds of the harvested beets are transported to storage and processing directly from the fields, by-passing the labor-consuming process of their manual cleaning. Dozens of farms from other beet-growing rayons of Orel Oblast have already completed sales of beets to meet their plan targets for this year and are now selling them in excess of the targets. [Text] [Moscow SEL-SKAYA ZHIZN' in Russian 6 Oct 83 p 1] 1386

LIPETSK SUGAR BEET HARVEST--Lipetsk--Sugar beets are being efficiently harvested by Lipetsk farmers. They are helped in this by the collective contract system, which stimulates the direct interest of the farmers and their partners in the end-result of the work. About 500 autonomous collectives work this year on Lipetsk Oblast kolkhozes and sovkhozes, and they all are achieving

good indicators. More than half of the areas planted with sugar beets in Lipetsk Oblast has already been harvested. [Text] [Moscow PRAVDA in Russian 17 Sep 83 p 1] 1386

HIGH QUALITY BEET HARVEST--Cherkassy--The quality of the beets received by sugar plants from the farms of Korsun'-Shevchenkovskiy Rayon is evaluated as "excellent." Much of the credit for this belongs to the link of "Sel'khoztekhnika" [Agricultural Equipment Association] adjusters headed by engineer P. Garkusha. Before starting work, the team toured every sovkhoz and kolkhoz and helped mechanizers to adjust equipment. Now, during the harvesting season, this link is watchfully keeping track of the condition of equipment. At present 43 specialized links of this kind operate in the oblast. Jointly with the sugar-makers and transport personnel, they are interested in maximizing the yield of sugar per hectare. [Text] [Moscow PRAVDA in Russian 17 Sep 83 p 1] 1386

PENZA BEET HARVESTING--Penza--Without going into the fields, the blue- and white-collar workers of the Nizhnelomovskiy Rayon "Sel'khoztekhnika" helped rural toilers on the farm under their patronage to rapidly unload and harvested beets at the sugar plant. They organized the final cleaning of the sweet tubers in the shop area, on delivering the harvested beets with their own transport to the plant for processing. [Text] [Moscow PRAVDA in Russian 17 Sep 83 p 1] 1386

ENTRUSTED TO MACHINERY--The pace of the fall season harvesting was markedly accelerated by the industrialized techniques employed by Leningrad Oblast sovkhozes in harvesting sugar beets. By entrusting all intricate operations to machinery, they succeeded in halving the time required to prepare succulent fodder on most of the tracts. [Text] [Moscow PRAVDA in Russian 9 Oct 83 p 1] 1386

COLLECTIVE CONTRACT SYSTEM INTRODUCED--The comprehensive organization of sugar beet harvesting operations in Belgorod Oblast enabled the farmers of Belgorodskiy and Krasnogvardeyskiy rayons to fulfill ahead of schedule their sugar beet sales plans. The autonomous sections assigned to the beet plantations grew a good harvest of the tubers. Thus, on farms of Belgorodskiy Rayon this harvest averaged nearly 300 quintals per hectare. [Text] [Moscow PRAVDA in Russian 9 Oct 83 p 1] 1386

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LIVESTOCK

NEW REGULATIONS FOR RSFSR LIVESTOCK PRODUCTION PROCUREMENT

Moscow ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 12, Dec 83 p 28

/Article by G. Savchenko, chief of State Inspection for Procurements of Animal Husbandry Products of RSFSR Ministry of Procurement : "New Development in Procurements of Animal Husbandry Products"/

/Text/ In 1983, for the purpose of stimulating greater interest among the farms in increasing the production and sale of agricultural products to the state, the purchase prices for many types of these products were raised.

In this regard, a number of new legislative statutes and normative documents concerned with procurements of animal husbandry products and with the accounts maintained with the suppliers of these products were adopted. This included in particular the "Instruction on the Payment To Kolkhozes, Sovkhozes and Other Agricultural Enterprises of a 50 Percent Bonus For the Sale To the State of Agricultural Products Over and Above the Average Annual Level Achieved During the 10th Five-Year Plan," "Instruction On the System For Determining the Payment and Computing the Purchase Price Bonuses For Agricultural Products Sold To the State by Low Profitability and Unprofitable Kolkhozes and Sovkhozes," "Instructions On the System For Accounting For the Livestock and Poultry Raised By Citizens On the Basis of Agreements With Kolkhozes, Sovkhozes and Other Agricultural Enterprises and Also the Crediting of Livestock, Poultry and Milk Purchased On the Basis of Agreements To the Production Volume and Fulfillment of the Plan For Procuring Agricultural Products By Kolkhozes, Sovkhozes and Other Agricultural Enterprises" and some others.

At the present time, a decision has been handed down in the RSFSR calling for the abolishment of Skotoprom /cattle industry/ associations in all areas and for the transferring of cattle procurement functions over to enterprises of the meat industry in a number of autonomous republics, krays and oblasts. Simultaneously with this, individual fattening sovkhozes are temporarily retaining the right to accept low-weight young stock supplied by kolkhozes and sovkhozes for further fattening and also cattle purchased from the population, with the issuing of acceptance receipts, and crediting towards fulfillment of the state procurement plan for livestock and poultry. The list of these sovkhozes has been approved by the RSFSR Ministry of Agriculture and the RSFSR Ministry of the Meat and Dairy Industry.

In other autonomous republics, krays and oblasts, the cattle procurement functions are being carried out by fattening sovkhozes under the direction of the agricultural ministries of autonomous republics and the agricultural administrations of kray and oblast executive committees. Subsequently, the plans for these autonomous republics, krays and oblasts also call for the cattle procurement functions to be transferred over to the meat industry.

In those autonomous republics, krays and oblasts where cattle procurements have been entrusted to the meat industry, the meat combines conclude contractual agreements for all of the cattle called for in the state plan for procurements at kolkhozes, sovkhozes and other agricultural enterprises and also for the initial weight of the cattle being delivered to fattening sovkhozes in accordance with acceptance receipts from farms and individual suppliers and the weight increase obtained. The only exception is those cattle delivered by the population directly to meat combines for the organizations of consumer cooperation and other consumers.

In connection with the loss by the fattening sovkhozes of the cattle procurement functions, changes have taken place in their relationships with enterprises of the meat industry. These relationships are now regulated not by the special delivery conditions for cattle as approved by USSR Gossnab and USSR Gosarbitrazh /State Arbitration Commission/, but rather by the contractual agreements, the Statute on the System for Concluding and Executing Contractual Agreements and the Instruction on the System for Carrying Out State Procurements of Cattle Meat, Poultry and Rabbits.

At the same time, reimbursement for the fattening sovkhozes for the overhead expenses incurred for organizing cattle procurements is abolished. With regard to payments for cattle transport expenses, instead of the reimbursement norms for transport expenses approved for the procurement organizations of the former RSFSR Skotoprom system, use is made both for kolkhozes and sovkhozes of unified rates for the transporting of goods by motor transport (No 13-01-01 for the RSFSR). The reimbursement for expenses for transporting cattle by rail and other types of transport is also carried out on a general basis.

Fines levied earlier against fattening sovkhozes for defects in the hides of cattle, hogs, sheep and goats delivered to enterprises of the meat industry have been abolished.

Commencing in 1981, kolkhozes, sovkhozes and other agricultural enterprises were authorized to purchase livestock and poultry from the population, with these products being credited towards the production volume and towards fulfillment of the plan for state procurements. Such crediting is carried out only in those instances where agreements are concluded with the population for the raising and procurement of livestock and poultry. The procurements are carried out on the basis of agreements with kolkhoz members, sovkhoz workers and employees and other citizens residing on the territory of a given farm and participating willingly in public production, and also with pensioners, at prices stipulated in the agreements but not higher than the purchasing prices.

Cattle purchased by farms from the population in the absence of agreements can be credited towards the production volume and towards fulfillment of the

procurement plan, provided they are delivered for fattening and sale to the state after the two month norm for weight increase has been obtained.

In the interest of strengthening the economies of farms and stimulating an increase in the production and procurement of agricultural products during the 1983-1985 period, bonuses have been established for products sold to the state by unprofitable and low profitability kolkhozes, sovkhozes and other agricultural enterprises. In addition to the purchase price amounts, these bonuses are paid out to unprofitable and low profitability farms for livestock, poultry and milk purchased from the population on the basis of agreements and sold to the state and for young cattle stock of a raised weight (350-400 kilograms, 400 kilograms or higher) -- bonuses of 35 or 50 percent.

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ESTONIAN EXPERIENCE IN INDUSTRIALIZING DAIRY FARMS, COMPLEXES

Moscow SEL'SKAYA ZHIZN' in Russian 28 May 83 p 2

[Article by E. Valdman, doctor of agricultural sciences: "'Keys' to the Complex"]

[Text] The changeover of dairy cattle raising to an industrial basis began in Estonia 10 years ago. No small amount of experience was accumulated and mistakes were made during these years. It is well known, for example, what difficulties were encountered by collectives of the dairy complexes which were created without a developed feed base and without a previously prepared herd. The Laatre Sovkhoz did not avoid mistakes either. With the startup of the large dairy farm, the productivity of the cows turned out to be considerably less than on neighboring farms. At that time the republic decided to transfer the sovkhoz to the jurisdiction of our institute so that the scientists themselves who created the technology could make it work.

The farm was in the charge of Khuno Toomiste, an experienced meadow worker and candidate of agricultural sciences; the selection work with the herd was handled by his wife, a candidate of agricultural sciences, Ekha Toomiste; and Olav Marits, also a candidate of agricultural sciences, took charge of the zootechnical work. Many difficult problems could be solved under the leadership of these experienced, knowledgeable people.

A green conveyor went into operation in the meadows. It produces feed for the cows which are kept in the stable year around. The sovkhoz specialists were able to form a dairy herd. There are now 1,100 dairy cows on the farm, and the animal husbandry workers annually receive from each of them more than 4,000 kilograms of milk with a fat content of 3.5 percent. They spend 103 feed units and 1.9 man-hours on the production of a quintal of products. The profitability of milk production has exceeded 40 percent. During a year each worker of the complex produces almost 25,000 rubles' worth of products.

The economic indicators are no lower on the industrial farms of the 9 Maya Kolkhoz in Paydeskiy Rayon, the Vyayke-Maar'ya Kolkhoz in Rakvereskiy Rayon, the Pydrangu, Ranna and Vyandra sovkhozes, and other farms of the republic.

But there are also other examples, in which the indicators of the operation of dairy complexes are lower than those of ordinary farms. Therefore one should consider not individual cases, but the general tendencies in the development of the branch. More than half of the republic's dairy herd is concentrated on

large farms. In order to orient ourselves more simply regarding the state of affairs, let us divide them into three groups, according to the number of head of livestock: up to 500 cows, from 500 to 800, and more than 800 cows. The first group includes more than half of the cows delivered for industrial maintenance. The average annual milk yields here amount to 3,450-3,550 kilograms; each "average" worker handles 24 cows, and each milkmaid, 52 cows. The second group contains almost 40 percent of the dairy herd which has been transferred to large farms. The milk yield here is 170 kilograms less than in the first group, but each milkmaid has 16 more cows. In the third group the productivity is approximately the same as in the first group, but here each milkmaid milks 23 more cows than the first group, and 7 more than in the second group.

If one continues the comparison one is convinced that in percentages the number of highly productive complexes and the number complexes on which the average milk yields from the cows is lower than the republic level are the same in all three groups. It turns out that the quantity of livestock concentrated on a large farm no longer essentially influences the productivity of the herd. The main thing is the organization of production.

Organizational problems are solved most simply on a farm which consists of two cow barns which are blocked and joined together by a passageway. Located in the passageway are the milking areas, containers for cooling the milk and other subsidiary premises. Each of the cattle yards holds 230-300 cows. The cow barns are joined by a covered passageway to the reproduction division as well, where there are from 140 to 180 pregnant cows or cows that have just given birth, and up to 140 calves. Such a farm accomodates a total of from 600 to 780 cows, including 475-615 milk cows. In our opinion, such a farm corresponds best to the present technical support for production.

Workers of our institute have also analyzed the dependency between the milk yields and the sizes of the groups. Here we were also oriented with reliable statistical indicators. For such high organization of production as is found at the dairy complex of the Laatre Sovkhoz has not yet been achieved everywhere. Not everyone can handle more than 100 cows, as Leyda Peyps does, an still obtain milk yields of 5,000 kilograms. We need more extensive generalization. Statistical figures concerning the operation of large farms in the republic show that at complexes where a milkmaid handles up to 60 cows, the milk yield has amounted to 3,541 kilograms. On farms where a milkmaid is assigned 80 cows, the milk yield has turned out to be almost 200 kilograms less, and in groups of more than 100 cows the decline was even more significant.

In Estonia dairy farms are constructed according to standard plans. The conditions on them are approximately the same -- labor specialization and machine milking. Under these conditions, a good deal depends on correctly determining the load per milkmaid. Not so long ago on one farm in Vil'yandiskiy Rayon a milkmaid, working with a milk line, undertook to handle 200 cows. But within a year she herself gave up her undertaking. In the first place, the productivity of the animals began to decline sharply, and, in the second place, she could not cope with so much work. Two hundred and more

cows can be milked in a special area with two-shift brigade servicing, the way it is organized in the complex on the Laatre Sovkhoz. But when milking with a milk line, in our opinion, the normal load per milkmaid should be no more than 100 cows. Now 82 percent of the dairy herd is gathered into such groups.

The distribution of "superlarge" groups in the various rayons of the republic also tells us a lot. Their proportion in Paydeskiy and Vil'yandiskiy rayons, the leading ones, for example, is exceptionally small. This is more an experiment than a rule. But in Khaapsaluskiy, Kingiseppskiy and Tartuskiy rayons, there is an unusually large number of superlarge groups -- on individual farms half of the herd is in them. These rayons can in no way be called the leading ones in milk production. The average annual milk yields of the cows her are almost a ton less than in the first two rayons that were mentioned.

The size of the group of dairy cows on a farm cannot depend either on the desire of the farm manager so set records or on the personal qualities of the master of machine milking. The number of cows in a group is an objective amount which is established by strict calculation. Let us recall the operations that are carried out during milking. First of all the milkmaid must disinfect the wiping materials and then prepare the cow's udder, disinfect the glass containers of the milking machines, and install them. Then come special devices for stripping and massaging the udder. Finally, the equipment is removed, and the milkmaid goes to the next animal. For all of these operations even the most experienced master of machine milking requires no less than 2 minutes. And if the cow is ill or restless during milking, the time expenditures increase considerably. So when establishing the number of cows in a group it is necessary the proper number of animals (and not more!) so that the milkmaid will have no less than these 2 or 3 minutes for each of them, and so that her work day does not last more than 8 hours. If this is not taken into account, excessive haste during work will lead to violations of the rules for milking and the productivity of the animals will decrease.

This is precisely the mistake made at the dairy complex of the Puka Sovkhoz. It has two milking areas. In one of them they observed all the zootechnical requirements and took an average of 2.1 minutes to milk each cow. In the other area the milking time per cow was unjustifiably reduced, averaging 1.4 minutes per cow. This haste was reflected in productivity: in the first area the daily milk yield was 1.5 kilograms higher than in the second.

I am telling about all this for one purpose: to emphasize that it is still a mandatory rule to take into account the objective conditions of each farm when determining the size of the complex, when selecting the technology for milk production, and when determining the quantitative composition of the group assigned to the milkmaid. A violation of this requirement entails the most undesirable results, and strict observance of it makes it possible to produce more milk with fewer expenditures. Industrial animal husbandry requires a considered and scientifically substantiated approach.

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MINISTER REVIEWS OPERATIONS OF FRUIT, VEGETABLE INDUSTRY

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/Article by N. T. Kozlov, USSR minister of the fruit and vegetable industry: "The Country's Fruit and Vegetable Complex"/

/Text/ The May (1982) Plenum of the CPSU Central Committee, which adopted the country's Food Program and mapped out the ways of its realization, was a major political event in the life of our party and state.

The Food Program ensures an average annual production of 37 to 39 million tons of vegetables and melon crops, 14 to 15 million tons of fruits and berries, 10 to 11 million tons of grapes and 90 to 92 million tons of potatoes during the 12th Five-Year Plan. This will make it possible to increase the per-capita consumption of vegetables and melon crops to 126 or 135 kg and of fruits and berries to 66 or 70 kg by 1990, or to raise it, as compared with 1980, by 30 to 39 and 74 to 84 percent respectively.

At the November (1982) Plenum of the CPSU Central Committee Yu. V. Andropov, general secretary of the CPSU Central Committee, stressed that the country's Food Program was not designed for 1 year, but the workers of the agroindustrial complex must work so that the vast funds allocated for the accomplishment of this task may give a return right now and even a greater return, tomorrow.

In the accomplishment of the tasks set an important role is assigned to the USSR Ministry of the Fruit and Vegetable Industry, which on the basis of an accelerated development of the country's fruit and vegetable complex is called upon to meet the population's need for vegetable and melon products, fruits, berries, table-variety grapes, potatoes and potato products, to conduct a single technical policy in the country in the field of procurement, processing, storage and sale of fruit and vegetable products, table grapes and potatoes, to ensure their preservation and to eliminate losses during production, procurement, transport, storage, processing and sale, to produce highly valuable planting stock and seeds, to develop trade through a specialized trade network and to organize the interrepublic and interoblast transport of fruit and vegetable products, grapes and potatoes.

The idea of making the fruit and vegetable complex a separate sector with an orientation toward the attainment of end results originated in many rayons and oblasts in the RSFSR, the Ukraine, Moldavia, Uzbekistan, Azerbaijan and other republics. As a result of the persistent and creative work of local party, Soviet and economic bodies directed toward the maximum satisfaction of the population's needs for fruit and vegetable products, grapes and potatoes, agroindustrial associations have been established and have successfully operated there for a number of years.

At present the system of the Union-republic USSR Ministry of the Fruit and Vegetable Industry includes 3,200 sovkhozes, 460 canning plants and other processing enterprises, 400 fruit and vegetable bases and offices, about 8,000 specialized stores for the sale of fruit and vegetable products and motor transport enterprises.

The subdivisions of the system of the USSR Ministry of the Fruit and Vegetable Industry, occupying 37 percent of the areas under vegetable crops and 27 percent of the perennial plantings of fruit and berry crops in the public sector, produce about one-half of the vegetables, 40 percent of the fruits and berries and more than three-fourths of the canned fruits and vegetables, store more than one-half of the potatoes, vegetables and fruits for the needs of trade and public dining and sell more than 40 percent of the fruit and vegetable products through the subordinate retail trade network.

The ministry's procurement organizations purchase more than 60 percent of the vegetables and fruits and about 20 percent of the potatoes from kolkhozes, sovkhozes, other state agricultural enterprises and the population in the zone assigned to them and supply more than 60 percent of the total volume of vegetables and more than 75 percent of the total volume of fruits to the all-Union stock.

Making the fruit and vegetable industry a separate and independent sector has increased the attention of local party and Soviet bodies to it and their responsibility both for delivering fruit and vegetable products to the all-Union stock and for providing the population of their regions with it has risen. It has become possible for economic bodies to more efficiently utilize material and technical resources and capital investments, to concentrate them on the weakest links of the fruit and vegetable conveyer and to solve social problems more successfully.

More than 2 years have passed since the ministry's formation and some results of work can already be discussed. As yet it has not been possible to attain a great deal, but a certain tendency toward improvement is beginning to show. More than 19 million tons of vegetables were procured throughout the country in 1982, which was 760,000 tons more than planned and 2.5 million tons more than in 1981. Such a quantity of vegetables was procured in the country for the first time. The plan for the procurement of food potatoes in a volume of more than 11 million tons was fulfilled. The procured grapes exceeded the 1981 level by 441,000 tons and the fruits, by 238,000 tons. The sector's industrial enterprises produced 8.7 billion standard cans of food, which was 9 percent more than in 1981.

Nor had such a quantity of canned fruits and vegetables been produced yet.

The increase in the production of fruit and vegetable products and in the volumes of their processing had a positive effect on the fulfillment of the trade turnover in the system's stores. In 1982 its growth comprised 14 percent.

All this ensured a guaranteed supply of potatoes and some types of vegetables for the population until the new harvest and also made it possible to increase the period of sale of fruits in fresh form.

Specific work on strengthening the material and technical base of the country's fruit and vegetable industry was done in 1982. A total of 2.156 billion rubles of capital investments, or 102 percent of the annual plan and 107 percent of the 1981 level, were utilized. In terms of volumes for production purposes capital investments were utilized 106 percent and construction and installation work was performed 104 percent. Fixed capital worth 2.1 billion rubles was put into operation, which comprised 109 percent of the 1981 level.

Significant work on increasing the efficiency of the fruit and vegetable complex was done during the current year. As compared with the corresponding period of 1982 the volumes of sale of early vegetables to the state increased by 10 percent and their delivery to the all-Union fund, by 5 percent. During the first half-year of 1983, as compared with the 1982 level, the purchases of livestock and poultry rose by 8 percent, of milk, by 6 percent and of eggs, by 9 percent. The semiannual plan for industrial commodity output was fulfilled 110 percent and for sold output, 106 percent. The produced canned fruits and vegetables exceeded the plan by 6 percent. At the expense of state capital investments fixed capital of a total estimated value of 638 million rubles was introduced in the system during the first 6 months, or 18 percent more as compared with the corresponding period of 1982. During January-June the trade turnover of the retail trade network increased by 4.4 percent, as compared with the corresponding period of 1982.

However, these are the first results of work and they cannot satisfy us fully. We see our shortcomings and unutilized potentials in an increase in the efficiency of the fruit and vegetable conveyer.

It is quite clear that the attainment of the goals outlined by the Food Program is possible only provided that land is utilized correctly, its fertility is increased constantly and a scientifically substantiated farming system fully taking into consideration the natural and economic conditions of every zone, oblast, rayon and farm is introduced.

The development of advanced technologies of cultivation of vegetable crops has been completed and their extensive check under production conditions has been carried out in the country in the last few years. These technologies take into consideration the natural and climatic characteristics of individual zones and ensure a tomato yield of no less than 400 quintals per hectare, a white cabbage yield of 700 quintals per hectare, a cucumber yield of 200 quintals per hectare, a carrot yield of 450 quintals per hectare and a common onion yield of no less than 200 quintals per hectare, while reducing labor intensiveness to one-third or one-fourth.

Farms introducing advanced technologies obtain high harvests of vegetables. For example, in 1982 the Strakhovskiy Sovkhoz in Rostov Oblast and the Volgo-Don Sovkhoz in Volgograd Oblast gathered 447 and 499 quintals of tomatoes per hectare respectively; the Zhdanovskiy Sovkhoz in Gorkiy Oblast, 520 quintals of carrots; the Avangard Sovkhoz in Donetsk Oblast, 370 quintals of onions; the Batumskiy Sovkhoz in Kherson Oblast, 390 quintals of onions.

The technology of mechanized cultivation and harvesting of tomatoes for processing is widely used on many farms in Dnepropetrovsk and Rostov Oblasts, Krasnodar and Stavropol Krays and the south of the Ukraine and Moldavia.

In all vegetables were cultivated according to the new technology on an area of 52,600 hectares in the country in 1982, including 38,000 hectares in the system of the USSR Ministry of the Fruit and Vegetable Industry, of which tomatoes were cultivated on 18,600 hectares, bulb onions, on 9,400 hectares and carrots, on 10,000 hectares. This made it possible to additionally obtain 260,000 tons of vegetables.

The production of high and stable harvests of vegetables and potatoes largely depends on the placement of these crops on reclaimed and, especially, irrigated land. At present 80 percent of the areas under vegetables are under irrigation conditions and the task of fully changing over to their cultivation on irrigated and reclaimed land by 1990 is set. The Central Committees of the Communist Parties and the Councils of Ministers of the Union Republics have been instructed, jointly with the USSR Ministry of the Fruit and Vegetable Industry and other interested ministries, departments and local party, Soviet and agricultural bodies, to establish large specialized farms and agroindustrial enterprises for the production and processing of fruit and vegetable products in the southern oblasts of the RSFSR, the Ukrainian SSR and the Kazakh SSR, in the republics of Central Asia and the Transcaucasus and in the Moldavian SSR. A base for supplying the population of the cities in the center and north of the European part, the Urals, Siberia and the Far East with heat-loving vegetables and fruits in fresh and processed form should be formed here.

Work on the specialization of the farms in the system of our ministry has already been done in these zones by now. Each of these farms will annually produce from 10,000 to 20,000 vegetable products.

A similar process of intensified specialization has already taken place on 50 farms. Last year 370,000 tons of vegetables were obtained on them.

Large-scale work on production specialization in the country's southern regions is also carried out in horticulture. Intensive orchards will be established on 148,000 hectares during the current five-year plan. The area of vineyards will be increased by 90,000 hectares.

For example, 15 specialized farms with a total orchard area of about 20,000 hectares, primarily orchards of highly valuable winter varieties of apples, pears and stone fruit crops, will be established in North Caucasus before the end of the five-year plan. By 1990, as a result of the beginning of fruit

bearing of these orchards alone, about 150,000 tons of fruits will be obtained. A total of 100,000 tons of these fruits are intended for delivery to the country's northern regions.

A total of 80 new fruit and grape sovkhozes were organized in the Uzbek SSR during the past 1981-1982. The measures taken in the republic will make it possible to increase the production of seedless grapes to 70,000 tons by 1990 and to deliver up to 150,000 tons of fresh grapes of the best table varieties to the Union stock.

The implementation of measures aimed at the realization of the Food Program concerning the establishment of the material and technical base of the fruit and vegetable industry in the country's southern regions will make it possible to increase by 1990 the deliveries of fresh vegetables to the all-Union stock by 620,000 tons, or by more than 30 percent, and of fruits and grapes, by 1.5 million tons, that is, more than twofold.

At the May (1982) Plenum of the CPSU Central Committee special attention was paid to an increase in the responsibility of local party, Soviet and economic bodies for meeting the population's needs for potatoes, vegetables, fruits and berries through their production in consumption regions, primarily around big cities and industrial centers.

In this direction work on farm specialization should be carried out with the maximum utilization of the specific agroclimatic and economic conditions of every rayon and the development of the productive forces of a given region.

With due regard for these factors extensive work has been done on the concentration of vegetable production and establishment of specialized sovkhozes around Moscow, Leningrad, Kiev, Vilnyus, Sverdlovsk, Omsk, Tomsk, Dnepropetrovsk and many other cities. The established sovkhozes almost fully provide their population with cabbage, carrots, sugar beets and green vegetables.

Much attention will be paid to providing fruit and vegetable products for the population of the country's largest industrial region--the nonchernozem zone of the RSFSR. A total of 25 specialized sovkhozes on reclaimed land with a total production volume of 300,000 tons of fruit and vegetable products are to be established here during the current five-year plan.

The development of berry production is also planned primarily in the suburban rayons of the nonchernozem zone. By 1990, as compared with the 1982 level, it will increase 3.5-fold, reaching 103,000 tons.

Throughout the country by 1990, as a result of specialization and concentration, up to 8.5 million tons of vegetables, which is 1.7 million tons more than the 1982 level, will be produced around industrial centers and big cities.

Speaking of farm specialization around large industrial centers, we take into consideration that in the country every year the output of polyethylene film increases and there is an intensive development of sheltered-ground vegetable growing, in connection with which in Siberia, in the Far East and in the zone of construction of the Baykal-Amur Trunk Line it becomes possible to additionally produce cucumbers, tomatoes, early cabbage and other vegetables by growing seedlings in film hothouses.

Winter hothouses on 588 hectares are to be built in these regions during the period of the 11th and 12th Five-Year Plans. An extensive utilization of the inexpensive waste heat of industrial enterprises and electric power stations, as well as of geothermal water, is envisaged. Plans are made to increase the production of early vegetables per city resident to 11 or 12 kg here, which corresponds to scientifically substantiated consumption norms.

I would like to especially mention the increase in output on sheltered ground. In the last 10 years about 4 billion rubles have been invested in the development of this sector and more than 2,500 hectares of winter hothouses with modern technology, where all the possibilities for the production of high stable harvests exist, have been built.

A total of 5,750 hectares of hothouses under glass and film will be built on the farms of the system of the country's fruit and vegetable complex in 1983-1990. In 1985, as compared with 1981, the delivery of sheltered-ground vegetables will increase by 290,000 tons, totaling 1.05 million tons. A total of 1.4 million tons are to be obtained in 1990. Along with the increase in the production volume, the task of significantly expanding the assortment of output from glass-covered ground is set.

The USSR Ministry of the Fruit and Vegetable Industry pays much attention to the increase in the production of potatoes, which the people call "second bread." They have become traditional food products even in the regions where previously their consumption was negligible. The regions of stable potato production have been determined quite clearly: They are the nonchernozem zone of the Russian Federation, Belorussia and the Baltic Area. The necessary measures for the specialization of farms and their provision with the necessary machinery, fertilizers and plant protection agents are taken here. Part of the potato plantations are to be placed on irrigated land so that, regardless of existing weather conditions, stable high harvests may be obtained.

However, big losses of potatoes during their transport from the zones of production to consumers are still observed. Many of the latter are located several thousands of kilometers away; for example, in the regions of the North, Central Asia, Kazakhstan and the Transcaucasus. Therefore, along with the cultivation of stable harvests, the organization of the processing of potatoes in the places of production into potato products and semifinished products is one of the directions in the improvement in the population's provision with food potatoes and reduction of losses.

In connection with this the USSR Ministry of the Fruit and Vegetable Industry pays much attention to problems connected with the buildup of the capacities of plants for potato processing and increase in the production of potato products. The reconstruction of almost all the plants transferred to the USSR Ministry of the Fruit and Vegetable Industry was carried out in 1981-1982, which made it possible for enterprises to operate at the rated capacity for the production of dry potato puree beginning in 1983.

The installation of the equipment developed by the specialists of the USSR Ministry of the Fruit and Vegetable Industry, as well as the Ministry of Machine Building for Light and Food Industry and Household Appliances and the

Ministry of Chemical and Petroleum Machine Building, at the experimental combine in the city of Gantsevichi in Brest Oblast is now being completed. This will be an enterprise with an annual production volume of dry potato puree of 3,000 to 5,000 tons, or 30,000 to 40,000 tons in terms of raw materials.

Along with the development of highly productive domestic equipment for the most rapid buildup of the capacities for potato processing plans are made to carry out close cooperation with other countries. The measures taken will make it possible to put into operation capacities for the processing of 2 million tons of potatoes annually in terms of raw materials.

Transport plays a significant role in the preservation of the grown fruit and vegetable products. Here there are also many questions and problems requiring an efficient solution. Individual types of fruit and vegetable products, such as green onions, strawberries, cherries and others, have a permissible transport period of only 2 to 3 days, which sets specific tasks in the selection of rational transport facilities. Experience has shown that at a distance of up to 2,000 km the use of motor transport is optimal during the conveyance of perishable and valuable products. There is an opinion that it is expensive to transport products by motor vehicles over large distances. However, it is necessary to examine this problem not only from the aspect of the cost of the transport itself or the rate, but also to take into account the possibility of supplying high-quality products for the population.

Let us take, for example, the delivery of some products from the Georgian SSR to the central oblasts of the RSFSR and Moscow. Last year 17,000 tons of early potatoes were delivered for the first time by motor transport to Moscow. What are the results? The period of delivery was shortened by 3 days, losses were reduced by 3 percent, which amounts to 510 tons of early potatoes worth 255,000 rubles, additional loading and unloading operations worth 66,500 rubles were eliminated and 700 refrigerator railroad cars were freed. Therefore, the USSR Ministry of the Fruit and Vegetable Industry considers the development of motor transport one of the most important tasks in the improvement in the organization of the delivery of fruits and vegetables. For this a network of motor vehicle enterprises is established in the zones of production and consumption of products. The pool is replenished with motor vehicle refrigerators, motor vehicle trains and motor vehicles for servicing trade and processing enterprises. This is especially important, because, in practice, all intrarayon transport operations are performed by motor vehicles.

Although motor transport is developing to an ever greater extent, the importance of other types of transport--railroad, water and air--should not be underestimated.

Today the basic volume of delivery to the all-Union stock falls on railroad transport and here the main problem lies in the acceleration of shipments. For this purpose routing, that is, the formation of special rolling stock with fruit and vegetable products moving at a higher speed, will be increased. The delivery of vegetables and fruits by railroad cars attached to passenger trains will be expanded.

To improve the shipment of tomatoes and watermelons to cities located in the basin of the Volga River from Astrakhan and Volgograd Oblasts, the use of special vegetable carrying vessels is envisaged. Two such vessels are undergoing tests this year. For the mechanization of the loading of fruits and vegetables six mechanized wharves are being built.

The development of the long-term plan for the shipment of fresh products by various types of transport is now being completed. Its introduction will make it possible to deliver more high-quality fruits and vegetables to consumers.

The preservation of products, reduction of losses and provision of the population with fresh fruits, vegetables and potatoes during the year largely depend on the existence and state of the material and technical base and on the introduction of advanced storage methods.

More than 6 million tons of fruit and vegetable products and potatoes are now placed in the storage facilities of our system. With such volumes even 1 percent of waste amounts to 60,000 tons. Therefore, the closest attention is paid to the construction and commissioning of modern storage facilities.

Storage facilities of a total capacity of more than 2 million tons will be built during the current five-year plan. At the same time, about 40 percent of them will be located directly at the places of production of fruit and vegetable products, which will make it possible to reduce the delivery of nonstandard products to the trade network of cities, to lower losses during transport, to improve the quality of products and to eliminate "peak" loads on motor transport during the fall period.

The creation of appropriate microclimatic conditions in storage facilities, which requires their modern technical equipment, is the most important link ensuring a good preservation of fruit and vegetable products. It is also planned to more widely introduce waste-free technologies envisaging the commodity preparation of products and their packaging and the mechanization of basic technological operations.

The organization of long-term storage of fruit and vegetable products at the enterprises of the Lithuanian SSR Ministry of the Fruit and Vegetable Industry has been organized well. On the republic's farms the acceptance of potatoes and vegetables in the localities by procurement organizations has been organized widely and acceptance and delivery centers have been built. Advanced methods of potato, fruit and vegetable storage are introduced actively here and the economic advisability of a specific method is evaluated.

Estonia also has positive experience in the storage of fresh fruit and vegetable products. For example, the Narva Sovkhoz in the Estonian SSR rationally utilizes all the existing possibilities. The storage of 2,000 tons of potatoes and 6,000 tons of cabbage, root crops and other products has been organized efficiently here. As a result of the fact that products are stored after a careful preparation, losses during storage are negligible. Before the sale of products they are graded again. Stores systematically receive only high-quality potatoes and vegetables during the year. Potatoes and sugar

beets are placed in clamps only if the content of the standard part is not below 92 percent. The sizes of clamps and their capacity are strictly limited--12 to 16 tons. Clamps are covered only after products are dried and during the storage period optimal conditions are maintained in them by means of active ventilation.

By 1990 the improvement in the material and technical base of storage through the construction of new and technical retooling of existing storage facilities will make it possible to significantly expand the introduction of such advanced methods as potato and vegetable storage with the use of active ventilation and natural and artificial cooling, fruit storage, in a controlled gas medium and fruit, berry and grape storage, in refrigerators.

The organization of rational processing technology is one of the most important links in ensuring the preservation of fruit and vegetable products and canning, when products after their placement in cans hardly have losses before consumption, is one of its most efficient methods.

When perishable raw materials are processed into finished products, along with preservation, it becomes possible to maneuver fruit and vegetable products and to better and uniformly supply them to the country's various regions throughout the year regardless of the seasonal nature of agricultural production. This is especially important for the regions of Siberia, the Far East and the Far North.

In 1982 about 300,000 tons of fruits and vegetables in processed form were delivered to the regions of the Far North alone. More than 2 billion standard cans of fruits and vegetables, which is equivalent to 1.2 million tons of fruits and vegetables in fresh form, were delivered to the industrial centers of the European part of the USSR from the southern regions of the RSFSR and of the Ukraine, Moldavia and the Transcaucasian republics.

However, the existing capacities for the industrial processing of fruit and vegetable products do not suit us yet. Over the long-range period the USSR Food Program envisages increasing the output of canned goods to 11.4 billion standard cans by 1985 and to 12.8 billion, by 1990. Much attention will be paid to the production of quick-frozen fruit and vegetable products and dry fruits, as well as to the development of the production and technical base for the output of these products. By 1990 the volume of production of quick-frozen products will increase to 76,300 tons, as compared with 7,500 tons produced in 1982, and of dry fruits, to 96,400 tons.

Implementing the line of fulfillment of these tasks, the USSR Ministry of the Fruit and Vegetable Industry follows the policy of moving the processing industry maximally closer to the places of production of fruits and vegetables, which will significantly lower the expenditures on transport and improve the quality and increase the preservation of raw fruits and vegetables.

The regional placement of heat-loving fruit and vegetable crops served as a strong impetus for the development of the processing industry in the country's southern regions.

High rates of development of the canning industry are envisaged in the southern regions of the RSFSR, the Ukrainian SSR and the Kazakh SSR, in the republics of Central Asia and the Transcaucasus and in the Moldavian SSR through the establishment of large specialized farms and agroindustrial associations for the production and processing of fruit and vegetable products. In these zones by 1990 a total of 1,020,000 tons of vegetables will be received for the processing industry, which is 50 percent more than in 1981.

The overall processing of raw materials will occupy an important place as a result of the introduction of low-waste and waste-free technologies at enterprises. For example, in 1985, as a result of such processing of apples, additional output worth 13 to 14 million rubles is expected and, as a result of the tripling of the volumes of aseptic canning of semifinished fruit products by 1990, the economic effect will total 27 million rubles.

Along with the introduction of low-waste technology problems connected with the processing of secondary raw material resources (apple and grape residues, fruit stones and tomato seeds) and the production of additional food products from them, that is, pectin, fruit powders and tomato and kernel oil, are also being solved.

In order to meet the customer's needs, it is important not only to grow products, to preserve them and to deliver them to the place of consumption. It is also necessary to be able to sell them. This requires modern specialized large stores taking into consideration the specific nature of fruit and vegetable products fitted with refrigerating and technological trade equipment.

For the time being, however, the existing network of specialized fruit and vegetable stores comprises only about 40 percent of their necessary number determined by the norm of 14.4 square meters per 1,000 serviced people.

Furthermore, not all stores have the necessary auxiliary premises and this deprives them of the possibility of installing the needed amount of refrigerating and technological trade equipment.

During the 11th Five-Year Plan the retail trade network is to be increased through the new construction and reconstruction of existing enterprises in the volume of 90,000 square meters. Consumer trade is further developed, especially during the season of the ripening and mass arrival of fruits and vegetables, through the small retail network.

The USSR Food Program pays special attention to the further development of scientific research and to the acceleration of the introduction of its achievements and of the advanced experience in the sectors of the agroindustrial complex into production. The 26th CPSU Congress stressed the following: "The introduction of scientific discoveries and inventions is now the decisive and most acute area. Scientific research and planning-design work must be more closely linked--economically and organizationally--with production." The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Acceleration of Scientific and Technical Progress in the National Economy" adopted in August 1983 indicates that ministries, departments, enterprises and organizations in their scientific production activity must strive

for the output of products, whose indicators meet the best modern models, as well as for the introduction of advanced technological processes, and on this basis significantly raise labor productivity in the national economy. The decree also points to the need for the development of goal-oriented scientific and technical programs and for a closer merging of science with production.

At present in the sectorial subordination of the USSR Ministry of the Fruit and Vegetable Industry there are 18 scientific research institutes, 28 experimental stations and 5 independent planning-design and special design and technological offices.

The principal attention of the sector's scientists is drawn primarily to the solution of production problems. In particular, providing the system's fruit and vegetable farms with high-quality seeds and planting stock is one of the most important tasks.

A total of 780 varieties and hybrids of vegetable and melon crops have now been regionalized in the country. They include 632 varieties and hybrids of vegetable crops, among which there are 72 varieties and hybrids of white cabbage, 73, of tomatoes, 64, of cucumbers, 61, of common onions, 30, of garlic and 28, of garden peas. A total of 1,678 varieties of fruit and berry crops have been regionalized. They include 499 varieties of pip fruits, among which there are 318 varieties of apples, 495, of stone fruit crops (127, of plums), 288, of berry crops and 253, of grapes.

Breeders face the task of developing new varieties and hybrids of vegetable, fruit and berry crops, of potatoes and of grapes meeting the requirements of industrial production technologies, resistant to unfavorable environmental conditions and hardly susceptible to pests and diseases.

The zonal placement of areas under vegetable seed crops in the country is of exceptionally great importance. In the opinion of scientists, it is advisable, for example, to grow the seeds of sharp varieties of common onions, carrots and other vegetable crops, which have been regionalized in the nonchernozem area, in Kazakhstan, Central Asia and the Ukraine.

The increase in production volumes and the specialization and concentration of seed breeding farms presuppose the application of more efficient methods of initial seed breeding, in particular, of family selection. Developments connected with these matters, as well as with norms of spatial isolation, are available in the All-Union Scientific Research Institute of Selection and Breeding of Seeds of Vegetable Crops, the Timiryazev Agricultural Academy, the Scientific Research Institute of the Vegetable Industry, the UkrNIIOB and other institutions.

As is well known, the concentration and specialization of farms in the breeding of seeds of vegetable crops gives a positive effect only when sown areas are placed in soil and climatic zones favorable for seed breeding and if labor resources, mechanization equipment and appropriate structures are available. However, if these conditions are absent, concentration and specialization do not operate fully. In particular, the concentration of seed breeding on the Boyarkino Sovkhoz in Moscow Oblast has not justified itself.

Scientific production associations are some of the new forms of advanced link of science with production. Kodru and Dnestr Scientific Production Associations (Moldavia), the Almaly Scientific Production Association (Kazakhstan), the Konservpromkompleks Scientific Production Association (the Ukraine) and others have been established and operate successfully in the system of the USSR Ministry of the Fruit and Vegetable Industry.

The Dnestr Scientific Production Association in Moldavia, which includes the Moldavian Scientific Research Institute of Irrigated Farming and Vegetable Growing with an experimental farm, the Kagul Experimental Station, eight specialized seed breeding sovkhozes, a design office with experimental production and a school for the training of vegetable growing experts, can serve as a convincing example of the integration of science with production under present conditions. The establishment of such an association has made it possible to significantly increase the effect of science in the republic through a more accelerated check and the introduction of research results into production.

Within the framework of the scientific production association the period of transfer of new varieties was shortened from 5-6 to 1-2 years as a result of the concentration of seed breeding on the association's farms. From the introduction of scientific research a significant economic effect is attained and every ruble of expenditures is recovered eightfold. With the development and improvement of agrotechnology and the introduction of advanced methods of cultivation the yield of vegetable crops has risen.

Significant advances have been made by the association's breeders. Three tomato varieties have been regionalized for combine harvesting. They are Kolokol'chik (early), Raduga (medium) and Nistru (medium-ripening), which are characterized by a high potential yield (600 to 1,000 quintals per hectare), resistance to diseases and good palatability and technological qualities of fruits. The Yevrika variety, one of the most transportable, is being prepared for regionalization. The marketability of its fruits during prolonged transport is retained at the level of 95 to 96 percent. There are also promising varieties of other crops.

Research on the improvement in the techniques and technology of processing of output is now of great scientific and practical importance. In accordance with the overall goal-oriented scientific and technical programs approved by the State Committee for Science and Technology and the USSR State Planning Committee specific studies of these problems are conducted with CEMA countries.

Experimental production for the overall processing of apples and citrus fruits and for the output of quick-frozen products is to be developed and mastered during the current five-year plan. The development of equipment for the aseptic canning of semifinished products in capacities of 100 and 300 cubic meters is carried out within the framework of goal-oriented programs. The performance of this work opens up the possibility for the establishment of secondary canning enterprises in the country's regions with due regard for their economic advisability.

The sector's scientists and specialists pay much attention to problems connected with the storage of fruit and vegetable products, in particular to the rational placement of storage facilities and introduction of advanced methods

of potato, fruit and vegetable storage. At present the storage base is being developed on the basis of the diagram for the placement of storage facilities for trade and public dining for the period until the year 2000 worked out according to the assignment of the USSR Ministry of the Fruit and Vegetable Industry by the Gipronisel'prom Institute.

Modern methods of storage at negative temperatures and in a controlled gas and modified medium and the use of chemical and mechanical protection agents find ever greater use.

As indicated in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Acceleration of Scientific and Technical Progress in the National Economy," the accelerated introduction of automated technological processes and control systems plays an important role in the increase in production efficiency. Therefore, our ministry together with the Ministry of Instrument Making, Automation Equipment and Control Systems plans to introduce a large number of automated control systems of different directions and new instruments and automation equipment with the use of microprocessor devices by 1990, which will make it possible to increase the efficiency of production of fruit and vegetable products by 10 to 15 percent.

The work of all the links of the country's fruit and vegetable complex, including the sector's scientific potential, is directed toward the search for and introduction of advanced technologies and modern equipment maximally saving material resources and capital investments.

Following the decree of the CPSU Central Committee and the USSR Council of Ministers "On Intensifying Work on the Saving and Rational Utilization of Raw Material, Fuel-Power and Other Material Resources" dated 30 June 1981 purposeful work is done on the basis of a rational utilization of the existing material and technical base on an increase in the efficiency of production, transportation, processing, storage and sale of fruit and vegetable products.

Scientific and technical councils play an important role in these matters. Major problems are submitted for consideration at their meetings; for example, such as the overall goal-oriented scientific and technical program of the Glavlenplodoovoshchprom "Improvement in the Preservation of Fruit and Vegetable Products, Rise in the Level of Mechanization and Automation of Production Processes and Improvement in the System for the Control of the 'Field-Storage Facility-Store' Complex,'" the state of and prospects for the work on waste-free technology of processing of fruit and vegetable products in the system of the USSR Ministry of the Fruit and Vegetable Industry, basic directions in scientific research and experimental-design work and drafts of goal-oriented overall programs envisaging the solution of problems connected with the accelerated development of the fruit and vegetable industry and so forth.

The maximum possible shortening of the periods of introduction of completed scientific and experimental design developments into production remains the priority task of scientific and technical councils.

The USSR Food Program and the measures for its implementation developed by the May (1982) Plenum of the CPSU Central Committee in their scale and depth of effect on all the spheres of growth of food production represent in their totality the most important economic and political task. A big role in its accomplishment is assigned to the system of the fruit and vegetable industry. We understand that the better work is organized at each specific section, the more significant our contribution will be.

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ADMINISTRATIVE PROBLEMS OF AGROINDUSTRIAL ASSOCIATIONS REVIEWED

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[Article by Vladimir Semenovich Prosin, candidate of economic sciences, chief of the main board of the USSR Ministry of Agriculture: "Agro-Industrial Associations in Action"]

[Text] In the complex of measures for creating favorable conditions for successful implementation of the Food Program, an important place is occupied by questions of improving the administration of agriculture and other branches of the agro-industrial complex. In connection with the creation of rayon and oblast agro-industrial associations, purposive work is now in progress in the country for rearranging the administrative structure of the APK. In the Estonian SSR an agro-industrial association was created as an experiment (Agroprom ESSR), and in the Georgian SSR -- the State Committee for Agricultural Production. The collection of articles published below considers certain problematic issues related to improving administration at various levels of the APK and elucidates the positive experience that has been accumulated in this matter.

There is no more important and responsible task facing the country's agro-industrial complex in the modern stage than successful implementation of the Food Program. For these purposes the May (1982) Plenum of the CPSU Central Committee earmarked, along with other measures, taking measures to improve the administration of agriculture and other branches of the agro-industrial complex, having in mind here strengthening the rayon level of administration, eliminating departmental separation, increasing the responsibility of each branch of the agro-industrial complex for increasing production volumes, improving the quality of foodstuffs and raw materials, and reducing superfluous units of the administrative staff.

The Plenum of the CPSU Central Committee recognized the need to create new administrative agencies in rural areas -- agro-industrial associations. At the present time such associations have been formed and are functioning in 3,102 rayons and 157 oblasts, krays and autonomous republics.

The rayon agro-industrial associations (RAPO) include all kolkhozes and sovkhozes located on the territory of the rayon, and also enterprises and organizations responsible for service for agricultural production, procurements, storage, and processing of agricultural products. They include repair, service and supply enterprises of Goskomsel'khoztekhnika, enterprises of Mezhkolkhozstroy and construction ministries, the Ministry of Land Reclamation and Water Resources, rayon agricultural chemization administrations, dairies and canning plants, meat combines, elevators and grain receiving points, and other enterprises that are directly involved in agricultural production.

Councils of rayon agro-industrial associations have been formed everywhere. Kolkhoz chairmen, sovkhoz directors, managers of enterprises and organizations of other branches of the agro-industrial complex, and representatives of social organizations have been elected to them. As the provisions stipulate, the managers of kolkhozes and sovkhozes comprise the majority in these councils. This provides for the priority of agriculture when considering and adopting decisions regarding the main issues related to the development of its production. We have also formed councils and presidiums of councils of oblast, kray, and republic (ASSR) agro-industrial associations. Provisions concerning the corresponding agro-industrial associations have been developed on the basis of standard provisions, taking into account the concrete peculiarities of the rayons, oblasts, krays and autonomous republics, and they have been approved under the established policy.

The necessary refinements have been made in the organization of the structure of working agencies of the councils of agro-industrial associations -- rayon, oblast and kray agricultural administrations, and republic (ASSR) ministries of agriculture.

Thus the formation of new administrative agencies in rural areas has been carried out basically in an organized way, within the established time periods, and under the leadership and control of party and soviet agencies.

As we know, the main tasks of the new administrative agencies are to take the necessary measures directed successful fulfillment of the Food Program, to utilize more completely the existing production-economic potential and all resources, to steadily increase production volumes, to improve the quality of agricultural products, to prevent losses of them, and to increase the effectiveness of all branches of the agro-industrial complex.

Here it is very important to find the correct and most efficient and effective forms of organization of administration not only of agriculture, but also of all the other branches of the agro-industrial complex. This is not such a simple matter, the more so since in recent years the circumstances have become so complicated that adminsitrative forms of control have frequently come to prevail in many places.

New administrative agencies must refrain from those old, unjustified methods of management which have impeded the development of production on the farms and have not enabled them to utilize existing reserves or to find new ones for

increasing the output of agricultural products, improving their quality, avoiding losses, and reducing production expenditures.

Our party has always oriented administrative agencies toward increasing the economic independence and initiative of enterprises in organizing work for fulfillment of assignments set for them by the state. Speaking about democratic centralism in administration, V. I. Lenin expressed the idea that "...centralism, understood in the truly democratic sense, presupposes for the first time in history the created possibility of complete and unimpeded development not only of local peculiarities, but also of local undertakings, local initiative, the diversity of ways, methods and means of moving toward the common goal." ("Poln. sobr. soch." [Collected Works], Vol 36, p 152.) These wise words of V. I. Lenin emphasize the need to develop a new style of work for the RAP, which envisions providing for maximum independence and creative initiative of managers and specialists of kolkhozes and sovkhozes in organizing production on a specific farm and in determining the technology of the production processes.

Increased production of products, fulfillment of state plans, and increased economic effectiveness of production -- these are the main criteria on which the evaluation of the farms' activity should be based. And they will basically decide for themselves how they will achieve this. They know best their own conditions and their own capabilities. On an average for one kolkhoz there are 26 specialists with diplomas, and on one sovkhoz -- 33. They, as they say, have the cards in their hands.

The organization of the development and implementation of measures for increasing the utilization of land, fixed production capital and capital investments that have been allotted, and for introducing progressive forms of organization and payment for labor and effective autonomous financing; good, informed advice; concrete assistance in solving problems which the farms themselves are not capable of solving; prompt information and the rendering of assistance in introducing the achievements of science and advanced practice -- these, from our point of view, constitute a typical feature of the new style of work of agro-industrial associations, which creates a businesslike situation and a healthy climate in interrelations with the farms.

It is known that granting greater independence to managers and specialists of farms considerably increases their responsibility for the decisions they make and for the fulfillment of tasks that have been set.

Unfortunately, we still encounter certain insufficiently experienced, and sometimes also careless workers on the farms. Therefore the higher agencies still have the right to supervise the activity of enterprises under their jurisdiction, and they have the right and obligation to intervene in their activity if the interests of the matter require this. But this should be the exception and not the rule.

A no less important peculiarity of the work of the councils of agro-industrial associations is that they direct the activity of other enterprises and organizations of the agro-industrial complex in the interests of developing

agriculture and ensuring the preservation and sale of all products that are produced. The extent to which this work is coordinated and smoothly arranged, the extent to which the efforts of all enterprises and organizations of the APK are organizationally and economically subordinated to the achievement of the final goal -- this will determine, to a decisive degree, the success of the matter as a whole. Proportional and balanced development of all branches, which is necessary for increased production of foodstuffs and the fulfillment of state plans by all enterprises of the agro-industrial complex, and above all state plans for the sale of agricultural products, will depend to a considerable degree on correct organization of the work of the councils of associations.

It is exceptionally important to establish correct organizational and economic interrelations among kolkhozes and sovkhozes, and the enterprises and organizations which are to serve them. Here it is necessary to thwart all attempts to replace departmental administrative agencies, attempts to transfer their functions to the RAPO council. On the contrary, their role and significance, and also their responsibility for meeting the obligations that have been placed on them, should increase. Enterprises and organizations that serve the kolkhozes and sovkhozes as part of the RAPO should not only perform the functions of contractors for certain kinds of work, but should also, as a rule, organize and provide for the operation of the entire branch as a whole and bear responsibility for its condition and development.

Take, for example, the organization of the activity of enterprises of the Goskomsel'khoztekhnika system. With the creation of rayon agro-industrial associations, the engineering and technical service in rural areas was significantly centralized, and many of the functions for the organization of repair and technical servicing of agricultural equipment on the kolkhozes and sovkhozes were transferred to rayon associations of Goskomsel'khoztekhnika. Almost everywhere their managers were appointed as deputy chairmen of the councils of the agro-industrial associations for questions of mechanization and electrification of agricultural production and material and technical supply.

The main engineering and technical service, the repair and preventive maintenance base for agricultural equipment, and warehouses for spare parts were concentrated practically under unified organizational management in the rayon. This considerably increases the responsibility of the Goskomsel'khoztekhnika system as a whole for maintaining the technical condition of the machine and tractor fleet, for increasing the technical readiness of agricultural equipment, and for improving the quality and reducing the time periods and cost of repair. The councils of agro-industrial associations have a right to demand all this locally from rayon production associations of Goskomsel'khoztekhnika.

As the same time, it seems to us, attempts by Goskomsel'khoztekhnika associations to take on functions for organizing the operation of agricultural equipment of the kolkhozes and sovkhozes are not altogether justified. These problems can be resolved most correctly and expediently only by the farms themselves. The activity of interfarm enterprises for mechanization in the

system of Goskomsel'khoztekhnika has not shown any appreciable positive results. At the same time they have increased expenditures on the work that is done, the number of personnel on the administrative staff and expenditures on maintaining them, the participation of machine operators in various jobs has become less active, and so forth.

As in the rayon production association of Goskomsel'khoztekhnika, the corresponding functions should be determined for enterprises of the system of the USSR Ministry of Land Reclamation and Water Resources, Soyuzsel'khozkhimiya and others.

Based on the tasks and functions placed on agro-industrial associations, the USSR Ministry of Agriculture and determined model structures for the administrative staff, and approved st ffs and staff normatives for rayon and oblast agricultural administrations, which have become the working staffs of the corresponding councils of agro-industrial associations. These structures and staffs envision, as much as possible, both the fulfillment by agro-industrial associations of the tasks for which they are responsible, and the style of work of the new agencies. Thus in the structure of the rayon agricultural administration they envision the creation of a fairly strong division for interbranch ties and planning, which should perform the basic and very complicated preparatory work involved in the coordination of the activity of all enterprises and organizations that are parts of the association. In the interests of the matter, in our opinion, it is necessary for this division to include no less than 25-30 percent of the overall number of administrative workers. At the same time, the creation of a relatively small production division which includes specialists from the various branches will make it possible for them to concentrate their attention resolving the basic, more long-range, and problematic issues, and they will not have to intervene as much in the daily activity of the farm specialists, having granted them more initiative and independence in solving technological and organizational problems of production.

Of new and principal importance is the fact that, as distinct from the associations that were previously created as an experiment in the Georgian SSR, the Latvian SSR and the Estonian SSR, the new agencies have been given more effective economic levers. These include: the right to determine the volumes of work and services rendered to the kolkhozes and sovkhozes by service enterprises, and also the rates and costs of the majority of them; the right to combine and redistribute capital investments and some of the material and technical resources; and, which is very important, the right to determine the conditions for awarding bonuses, taking into account the final product received in agriculture, for managers and specialists of all enterprises and organizations that are included in the association, regardless of their departmental jurisdiction.

Great opportunities have been granted to agro-industrial associations for forming and utilizing money of centralized funds, which are created from deductions from funds of the enterprises and organizations that are included in the association.

The RAPO council has been granted extensive rights in exercising control over the activity of enterprises and organizations that are included in the association. It can hear reports from managers of enterprises and organizations concerning their fulfillment of plans and assignments for the production, procurement, storage, shipment and processing of agricultural products, the correctness of calculations concerning these, deliveries of machines, equipment, materials, spare parts and mineral fertilizers, work that has been conducted for various kinds of services for the kolkhozes and sovkhozes, and other issues involved in joint activity, and it can make the necessary decisions regarding them.

Generalizing what has been said, one can say that a qualitatively new administrative agency has been created in rural areas, which not only provides leadership for the absolute majority of agricultural enterprises, but is also called upon to direct and coordinate the activity of all enterprises and organizations that are included in the agro-industrial complex.

Familiarization with the activity of agro-industrial associations shows that the measures adopted by the party and the government for improving administration of agriculture and other branches of the agro-industrial complex were timely and correct.

Not enough time has passed to evaluate the new administrative agencies fully, but even now one can speak quite definitely about a whole number of positive aspects of their influence on agricultural production and on other branches that are related to it.

Above all, the rayon level of agricultural administration has been strengthened. In the system of the USSR Ministry of Agriculture, more than 2,000 various administrative organizations, trusts, offices and groups have been abolished. About 5,000 sovkhozes have been transferred to the jurisdiction of rayon agricultural administrations. As a result, many of the specialists who were released have gone to work on the kolkhozes and sovkhozes.

The majority of agro-industrial associations devote major attention to questions whose solutions contribute to increasing the production of agricultural products and implementing the Food Program. Coordinating the activity of the enterprises that are included in the associations, they direct it primarily toward improving production and technical service and material and technical supply for agriculture, overcoming the backwardness of the weak farms, and introducing into production advanced technologies and progressive forms of organization and payment for labor.

This year the board of the USSR Ministry of Agriculture has considered questions of the work experience of the Yershovskiy RAPO in Saratov Oblast and the Novomoskovskiy RAPO in Tula Oblast. These associations have developed and are implementing a complex of measures directed toward successful fulfillment of the tasks that have been set for them.

Thus the activity of the Yershovskiy RAPO has been concentrated on problems whose solution contributes to increasing the production of agricultural products, increasing the influence of the enterprises and organizations included in the rayon association on the solution to this major problem, improving product quality, and increasing the efficiency of production as a whole. The council devotes special attention to bringing the interests of all participants in the association closer together. Here, a good deal is being done to overcome their departmental separation.

At meetings of the association council, which are held monthly, they consider questions which, as a rule, are of an interbranch nature:

the results of the work of the Poliv production association of the USSR Ministry of Land Reclamation and Water Resources in 1982 and the tasks for introducing the collective contract into its activity;

the work of the Goskomsel'khoztekhnika association for organizing the repair of technical equipment and the readiness of the kolkhozes and sovkhozes of the rayon for conducting the harvest campaign;

the approval in 1983 of the plan for distributing material-technical resources and spare parts among the farms;

the comprehensive plan for agrochemical service for the kolkhozes and sovkhozes of the rayon and the distribution of the supply of mineral fertilizers;

the fulfillment by the Goskomsel'khoztekhnika association of the plan for technical servicing of the machine and tractor fleet and the utilization of fuel and lubricants;

the results of the fulfillment of the quarterly plan for the production and sales of animal husbandry products and improvement of their quality;

the introduction of the collective contract on the kolkhozes, sovkhozes and other enterprises and organizations of the rayon's agro-industrial complex;

the distribution of budget allocations among the kolkhozes of the rayon in 1983.

Every question raised for consideration by the association council is carefully prepared beforehand by the appropriate commission, and a total of seven of them have been created, enlisting a broad group of specialists from farms and service and processing enterprises, and advanced production workers.

It should be noted that a large amount of work is being done by the RAPO council and the rayon Goskomsel'khoztekhnika association, which is essentially in charge of the engineering service in the rayon. During the busiest work period, workers from other branches of the APK are sent to help the kolkhozes and sovkhozes. Staffing the sets of planting equipment for work on two shifts made it possible for farms of the rayon to plant the early grain crops at the

optimal times in 100 hours. The feed harvesting equipment was prepared promptly, and the coefficient of technical readiness of the automotive fleet reached 95-100 percent for the first time in many years. In keeping with a decision of the RAPO council, 140 repair workers were taken from other enterprises and organizations of the association to repair harvesting equipment.

All this has become possible only under the conditions of the work of the agro-industrial association, where the interests of all enterprises and organizations are subordinated to a single common goal -- to produce more agricultural products.

The activity of automotive transportation of Transsel'khoztekhnika has been reoriented in the rayon. Previously, the majority of motor vehicles of this enterprise were used not on the kolkhozes and sovkhozes, but frequently outside the rayon. The association council made a decision to utilize automotive transportation of Transsel'khoztekhnika primarily on the farms of the rayon. As a result, the volume of shipments of cargo for the kolkhozes and sovkhozes of the rayon increased 3-fold in 4 months. In addition to this, the rayon successfully coped with the plan for the transportation of mineral and organic fertilizers to the fields.

The RAPO council devotes a good deal of attention to questions of improving economic interrelations between the kolkhozes and sovkhozes, and the enterprises and organizations that provide services for them. Thus the association council analyzed the existing costs of services rendered to the kolkhozes and sovkhozes by water management enterprises, and made a decision to reduce them.

The RAPO council decided to pay for the labor of workers of the Poliv association, who are working on the kolkhozes and sovkhozes on the basis of a collective contract, not in terms of the quantity of irrigated land, but in terms of the final result: during the course of the year they are given advances like the other members of the farm's brigades and teams, and the final account is settled with them, depending on the quantity of products obtained.

One of the important issues which was placed at the center of the attention of the association council is the strengthening of the economies of farms that operate at a loss or are less profitable. The rayon agricultural administration conducted an in-depth analysis of the economic condition of the kolkhozes and sovkhozes during 1979-1982, and the council earmarked concrete measures for solving this problem.

The RAPO council considers and resolves issues related to the development not only of agriculture, but also of other branches of the agro-industrial complex that are associated with it. Thus, in keeping with a council decision, at the present time funds from the farms of the rayon are being used to expand the production capacity of the existing meat combine to 10 tons of meat per day. This will make it possible for the kolkhozes and sovkhozes to practically avoid losses from delivering livestock to the city of Engels which is 180-260

kilometers away. The Kolkhoz imeni XVIII Parts"yezd alone in 1982 lost 22,400 rubles this way, and the kolkhozes and sovkhozes of the rayon as a whole lost no less than 150,000 rubles and 1,240 quintals of meat.

The council of the agro-industrial association has earmarked measures for renovating existing points for initial processing of milk and for creating new ones. This will make it possible for the farms to sell higher-quality milk and to avoid losses of it.

It is intended to use cooperative funds to construct an unloading area by the railroad for receiving cargo coming in to enterprises and organizations of the rayon. This will not only provide for prompt unloading of the cars, but will also make it possible to avoid the payment of fines to the railroad, which last year alone amounted to 43,600 rubles.

An evaluation of the first steps in the activity of the agro-industrial association shows that the main issues in the work of agricultural enterprises and also enterprises and organizations that serve them are now being resolved more thoroughly and efficiently, and more attention is now being devoted to eliminating bottlenecks in production, eliminating departmental barriers, and developing and implementing coordinated decisions.

A large amount of purposive work is also being conducted by the council of the Novomoskovskiy RAPO in Tula Oblast. The organizational base of the association's work here is interesting. It is reflected in the creation of unified services for the main kinds of production in the rayon.

The previously arranged system for control of the branches of the APK in the rayon was cumbersome and disjointed. Thus nine of the head agronomists were under the jurisdiction of six different departments and organizations, and seven of these were oblast departments and organizations. This reduced the coordination in the development of unified decisions and weakened technological discipline on the farms. In the rayon agricultural organizations and enterprises there were 47 engineering and technical workers under the jurisdiction of 17 departments.

Departmental separation in administration was a serious impediment to efficient planning, material and technical supply, and the implementation of measures for specialization and concentration of production.

The RAPO council has created unified services for control of the branches of the rayon APK: engineering and technical, animal husbandry, agronomy, planning and finance, with a division for interbranch ties and planning, legal, and a unified personnel service.

As a result, the working agency of the RAPO council is now not only the rayon agricultural administration, but also the entire combined staff of the same kinds of services of the enterprises and organizations.

Thus the unified engineering and technical service includes specialists of the Goskomsel'khoztekhnika association, enterprises and organizations that serve

agriculture, and also the engineering and technical services of the kolkhozes and sovkhozes. It is headed by the chairman of the Goskomsel'khoztekhnika association, who is the RAPO council deputy chairman for mechanization, electrification, automotive transportation service, and material and technical supply for agriculture.

Other unified services are headed by deputy chairmen of the RAPO council or division chiefs of the rayon agricultural administration.

Within the RAPO interbranch commissions have been created for economics, administration, labor organization, and production in the branches of the APK; for interbranch ties; and for production and the quality of products and work.

The RAPO work plan is formed on the basis of suggestions that come in from the agricultural administration of the rayispolkom, interbranch commissions, kolkhozes, sovkhozes, and other enterprises and organizations.

At the meetings of the RAPO council, primary significance is attached to questions of increasing the efficiency of the utilization of land, capital investments, material-technical, labor, financial and other resources; introducing scientifically substantiated systems of farming; extensively disseminating on the kolkhozes, sovkhozes and other enterprises autonomous financing and progressive forms of labor organization on the basis of the collective contract; meeting contractual commitments; and developing direct ties between the kolkhozes and sovkhozes, and enterprises and organizations that provide service for them, and also procurement, processing and sales of agricultural products.

The council of the agro-industrial association devotes a good deal of attention to problems related to improving the service for the kolkhozes and sovkhozes and strengthening the production and economic interrelations between procurement and processing enterprises and organizations, and the kolkhozes and sovkhozes. For example, the council adopted a decision to change the prices and rates for jobs and services performed for kolkhozes and sovkhozes by the Goskomsel'khoztekhnika and Sel'khozkhimiya associations. As a result, overhead expenditures of the first organization dropped on an average from 220 to 80 percent, and for work performed by the latter, rates decreased by an average of 10-12 percent. Adjustments were also made to the system of mutual accounts between the kolkhozes and sovkhozes, and other service enterprises and organizations.

They have considered the question of increasing the effectiveness of the service for the kolkhozes and sovkhozes provided by the Goskomsel'khoztekhnika association. Their production relations have been based on more efficient utilization of the repair base which exists in the rayon. Capital repair of agricultural equipment for nine farms will be carried out in specialized shops of Goskomsel'khoztekhnika, and for six kolkhozes and sovkhozes -- directly in their own shops.

The RAPO council has made it incumbent on the Sel'khozkhimiya association to provide comprehensive agrochemical service primarily for backward farms with

unstable economies, where the level of profitability is less than 10 percent. The creation of fertility detachments on each farm of the rayon will make it possible as early as 1984 to increase the application of organic fertilizers to 10 tons per 1 hectare of arable land, to sharply improve the quality, and to reduce the time periods for conducting agrochemical work. In keeping with a decision of the RAPO council, an interfarm agrochemical laboratory has been organized for analyzing soils. Each year it will publish cartograms for all farms of the rayon for applying mineral fertilizers, lime and phosphorites to the soil.

The council devotes a good deal of attention to introducing progressive forms of labor organization and wages. On six farms all the arable land has been assigned to autonomously financed mechanized detachments under contract. Development is being completed on the technical and economic substantiation for changing dairy farming over to the collective contract on three farms, and on one farm fattening of cattle will be changed over to this method. Work is being done to introduce the collective contract for service enterprises and organizations.

Taking advantage of the right granted by the provisions, the association council, on the basis of suggestions from the kolkhozes and sovkhozes, has revised the production assignments for the second half of 1983 for enterprises and organizations that provide service for agriculture, within the bounds of the material and technical means and funds allotted to them and the limits that have been established.

The RAPO council attaches a great deal of significance to the interest of workers of enterprises and organizations that serve kolkhozes and sovkhozes in the final results. Conditions have been established for awarding bonuses to them. For example, two indicators have been adopted for awarding bonuses to workers of Goskomsel'khoztekhnika: for an increase in the production of products on the farms they serve as compared to the average annual indicators for the 5 preceding years, with a reduction of expenditures, and for fulfillment of contractual conditions as well as for surpassing the normative indicators of the readiness of the machine and tractor fleet according to the calendar periods established for each farm.

The association has developed conditions for the creation and utilization of centralized funds. Thus centralized funds for material incentives and social and cultural measures and housing construction are being created as a result of 3-percent deductions from similar funds for farms with unstable economies and a profitability level of less than 10 percent, and 5-percent deductions for the rest of the kolkhozes, sovkhozes, enterprises and organizations that are included in the RAPO.

A centralized fund for the development of production is being created from deductions of 15 percent of the internal funds intended for these purposes by the kolkhozes, sovkhozes, and service, procurement, processing and other enterprises and organizations of the RAPO. Farms with unstable economies and a profitability level of less than 10 percent do not have to participate in the formation of this fund.

Evaluating the activity of the Novomoskovskiy association, one can say with confidence that the extensive rights that have been granted are being utilized intelligently and fairly effectively in the interests of developing production.

From the first days of their work, many other associations have been solving pressing important problems. Thus the councils of the agro-industrial associations of Dmitriyevskiy and Oboyanskiy rayons in Kursk Oblast have earmarked concrete measures for the receipt of livestock by the meat combines directly on the farms.

In Kokchetav Oblast the council of the Shchuchinskiy RAPO discussed the question of measures for improving the material and technical supply of farms of the rayon in order to increase the technical readiness of agricultural machinery.

The council of the Kirov agro-industrial association in Mogilev Oblast envisioned hearing a report from the rayon Goskomsel'khoztekhnika association and other enterprises that serve the kolkhozes and sovkhozes concerning measures for reducing the cost of work that is performed and services that are rendered.

The council of the Echmiadzinskiy RAPO in the Armenian SSR has considered questions of improving the receipt and processing of agricultural products by procurement organizations, of increasing the effectiveness of the utilization of irrigation systems, of improving the work of the Sel'khozkhimiya association for providing the kolkhozes and sovkhozes with mineral fertilizers, and of measures for increasing the fertility of the land.

At a meeting of the council of the Dnepropetrovsk Oblast agro-industrial association they considered questions of regulating economic relations among enterprises and organizations of the oblast agro-industrial complex.

Along with the consideration and resolution of a number of large problems and future issues, the councils of the agro-industrial associations devote a great deal of attention to work of an operational nature, which is related to preparing for and conducting field work, procuring feeds, and fulfilling state plans for the procurement of animal husbandry products. In many places problems of an interfarm nature are being solved better, and specialists and managers of kolkhozes and sovkhozes are being granted more independence in solving technological and organizational problems related to agricultural production.

Still, as inspections and analysis of the activity of new local agencies show, mistakes are being made and there are essential shortcomings in the process of the establishment of agro-industrial associations.

RAPO councils have not yet really entered into the work everywhere, their influence is reflected insignificantly in the activity of enterprises and organizations of the rayon agro-industrial complex, and the staffs of the councils are slow in being filled. Such cases can be found in a number of

rayons and oblasts of the Russian Federation, the Uzbek SSR, the Kazakh SSR, the Kirghiz SSR and the Armenian SSR.

A serious shortcoming of certain RAPOs is the fact that kolkhoz chairmen and sovkhoz directors do not constitute the majority in their councils. In this case it is not always possible to make the necessary decisions in the interests of the development of agriculture, when there are objections on the part of representatives of other branches. For example, in the Armenian SSR in 6 of the 38 RAPO councils kolkhoz chairmen and sovkhoz directors comprise the minority. There is an especially small representation of managers of kolkhozes and sovkhozes in the RAPO councils of the Moldavian SSR.

Certain republics and oblasts have established an inefficient administrative structure for the working staff of the RAPO council, which does not reflect the peculiarities of the nature of the work under new conditions, envisioning the concentration of considerable attention on the coordination of the activity of enterprises and organizations of the APK, and also the provision of maximum economic independence for the kolkhozes and sovkhozes. Thus in the structure of the rayon agricultural administration in the Armenian SSR, the production division consists of 8-10 people, which the division for interbranch ties and planning includes only 3-4 people. In Yaroslav and Ulyanov oblasts divisions for interbranch ties and planning have not been created at all. Such a situation, of course, does not make it possible to provide for effective work of the agro-industrial association.

At their meetings certain councils consider questions of economic activity, which could have been resolved as part of the work of the rayon agricultural administrations, other branch agencies or the enterprises and organizations themselves. Thus the council of the Artashatskiy RAPO of the Armenian SSR, at its meeting during the first quarter, immediately heard a report from seven kolkhoz chairmen about the course of the wintering of livestock. There are similar cases in Sverdlovsk Oblast in the RSFSR, Mogilev Oblast in the Belorussian SSR and Bukhara Oblast in the Uzbek SSR.

Such a practice reduces the role of the councils of agro-industrial associations to a certain degree, and does not contribute to increasing the economic independence and initiative of the kolkhozes, sovkhozes and other enterprises and organizations that are included in the associations.

Not everywhere do the managers of rayon production associations of Goskomsel'khoztekhnika actively restructure their work to correspond to the new conditions, and they do not take on the responsibility for the technical readiness of agricultural equipment on the kolkhozes and sovkhozes.

In a number of rayons repair enterprises of Goskomsel'khoztekhnika are narrowly specialized and serve kolkhozes and sovkhozes of several rayons. Some of them have not entered rayon agro-industrial associations and are practically outside the sphere of their influence. This narrow specialization of repair work is apparently not always justified. This is shown by the high transportation expenditures for delivering equipment over long distances, which result in a considerable reduction of the economic effect from such

organization of specialized repair. It seems to us that, as a rule, there should be a general purpose repair shop of Goskomsel'khoztekhnika in each rayon. This is a guarantee of correct organization of the repair of tractors, combines and other agricultural equipment, and its prompt preparation for field work.

Other problems also arise, for which the need for an immediate solution has become more marked under the work conditions of the new administrative agencies. Thus the existence in the rayon of several independent organizations of Goskomsel'khoztekhnika, which are under the jurisdiction of the corresponding oblast agencies, can hardly be justified. They include repair enterprises, enterprises for batching and adjusting mechanisms on animal husbandry farms, automotive transportation enterprises, and so forth. Recently people have been "pushing" more and more persistently the idea of creating a rural energy service, which is unified from the rayon to the union level, in Sel'khozenergo. Of course, such a service is needed, and it exists in the majority of republics, but is it necessary to make it separate, and then create an independent production base in the "empty" spots everywhere, when Goskomsel'khoztekhnika is right there?

The subordination of all these enterprises and organizations will evidently make it possible to solve production problems more smoothly and efficiently, to refrain from using capital investments for creating a parallel production base, and to utilize the existing one more efficiently. It is also possible to release many good engineers who would be useful on the kolkhozes and sovkhozes.

Supply organizations of Goskomsel'khoztekhnika are constantly being criticized locally for their disproportional distribution of spare parts among their own repair enterprises, kolkhozes and sovkhozes. There is more than enough justification for such criticism. Having a monopoly on spare parts, Goskomsel'khoztekhnika, of course, supplies them first to its own repair enterprises, and the kolkhozes and sovkhozes get what is left over. There is a justifiable reason for this -- their own plan, since in the final analysis the evaluation of the association's activity depends on the level of its fulfillment. And although the RAPO council is given extensive rights in distributing the number of repair jobs at enterprises of Goskomsel'khoztekhnika and shops of the kolkhozes and sovkhozes, in supervising the distribution of spare parts, and also in evaluating the activity of this association, the danger that its own plan will constantly take the upper hand over other indicators still remains. Possibly, the repair plan for Goskomsel'khoztekhnika should be the overall number of repair jobs, regardless of where they are carried out? But in this case it could happen that Goskomsel'khoztekhnika would demand that the repair shops of the sovkhozes and kolkhozes along with their staffs be transferred to its system. And this cannot be done in any case. The removal of the shops from the jurisdiction of the farms would considerably paralyze the organization of the work of other production branches of the kolkhozes and sovkhozes.

Of course, the problems presented here need deeper study and evaluation in light of the common interests of the entire agro-industrial complex.

One is concerned about the fact that certain RAPO councils in their work still do not take advantage of all the opportunities granted to them by the Standard Provisions. Frequently the chairmen of RAPO councils are indecisive in coordinating the activity of enterprises and organizations that are included in the association, they have still not recognized the possibilities of all the rights and responsibilities assigned to them, and they are afraid of the responsibi- lity of decisions involving the activity of the rayon agro-industrial complex.

Many RAPO councils still rarely consider questions of adjusting planning indicators for enterprises of the rayon agro-industrial complex, centralization of the performance of individual production and economic functions, revision of rates and costs of services that are rendered, and the creation and utilization of centralized funds.

A large mistake is being made by those RAPO councils which have not yet determined or have not approved conditions for awarding bonuses to management workers of enterprises and organizations that are included in the association, depending on the final results of their labor. Standard provisions for awarding bonuses to this category of workers of Goskomsel'khoztekhnika and Soyuzsel'khozkhimiya have been developed and have long been available locally. It is important to determine without delay those conditions which take into account local peculiarities of the organization of production and, as soon as possible, to make them available to all workers whom they concern.

Not all specialists of agricultural organizations and managers of enterprises and organizations that are included in agro-industrial associations have a clear idea of their rights and responsibilities under the new conditions, and without knowledge of them it is difficult to carry out concrete work.

The USSR Ministry of Agriculture has developed model provisions for all structural subdivisions of rayon agricultural administrations in relation to the functions of the working staff of the RAPO council that have been assigned to it, and in the near future they will be sent to the local areas. This will help to a certain degree in providing a clearer understanding not only of the tasks that have been set for workers of rayon agricultural administrations, but also of how to carry them out.

Unfortunately, there are many cases in which the republic and oblast agricultural agencies are playing a waiting game in questions of rendering assistance and directing the activity of the corresponding agricultural administrations, which have been made responsible for new and difficult tasks related to the activity of the entire agro-industrial complex of the rayon or oblast. Helping them in this is the primary duty of the higher agencies.

Many normative documents of the ministries and departments of the APK have not been brought into line with the provisions concerning agro-industrial associations in the area of planning, economic relations, material incentives and so forth. The recently adopted decrees of the CPSU Central Committee and the USSR Council of Ministers, "On Improving Economic Relations Between Agriculture and Other Branches of the National Economy," and of the USSR

Council of Ministers, "On the Policy for Planning and Material and Technical Supply in the System of the USSR Agro-Industrial Complex," make it incumbent on the corresponding ministries and departments to carry out this work.

The organizational and economic relations among participants in agro-industrial associations are determined by a number of normative documents. Knowledge and correct application of these in practical activity is one of the most important conditions for effective work of the associations. Familiarization with the local areas shows that many organizational and economic levers at the disposal of RAPO councils are still far from being fully utilized, and in a number of cases the new agencies are working according to the old methods. This causes alarm and creates an objective need to conduct training of managers of agro-industrial associations everywhere. It should be noted that in the Latvian SSR, the Azerbaijan SSR and the Armenian SSR such seminars have already been conducted, with the participation of workers of the USSR Ministry of Agriculture.

The system of planning and accounting indicators established for the kolkhozes and sovkhozes remains extremely cumbersome, as before. The industrial and financial plan and the annual report of a sovkhoz contains almost 30,000 indicators. The inclusion of other enterprises and organizations in RAPOs has entailed increasing the number of these indicators. The flow of various papers coming in to rayon agricultural administrations has increased because they have been assigned the functions of the working staff of the RAPO council. All this creates an abnormal situation for the organization of concrete, efficient economic work and the performance of the functions for coordinating the activity of the agro-industrial complex.

Local and the corresponding union agencies should take a more attentive and responsible attitude toward eliminating the aforementioned shortcomings, and contribute in all ways to helping the new administrative agencies in rural areas to begin to work efficiently and effectively.

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OPERATIONS, STRUCTURAL SYSTEM OF AGROINDUSTRIAL ASSOCIATIONS ANALYZED

Moscow EKONOMICHESKIYE NAUKI in Russian No 8, Aug 83 pp 84-87

[Article by Ye. Kulish, candidate of economic sciences, Nikolayev: "Organizational Forms and Management of Agroindustrial Associations"]

[Text] The practice of building communism shows that the fusion of industrial and agricultural enterprises into a single operational and social-economic organism, taking place with the development of the productive forces of socialist society, has become an important factor in increasing the production output of the agrarian sector. For this reason, expansion of intersectorial ties is considered in the USSR Food Program as an important direction of its realization. Boosting the effectiveness of agroindustrial integration out of urgent necessity requires measures for improving the mechanism of managing agroindustrial units. These questions are of particular importance for agroindustrial associations (APO)--a qualitatively new form of collectivization of production characterized by greater complexity of the organizational structure and economic and social interrelations. This is largely determined by the fact that with growth of the number of managed units, installations, the complexity of the problems of management grows as a rule in much greater proportion.

In practice, various forms of APO structure are used. In each concrete case, it is possible for them to have a diverse combination of forms of production organization, operational-economic independence and management structure. At the present stage of development of agroindustrial integration, agroindustrial associations should be arbitrarily divided into three types: associations with retention of economic and juridical independence by enterprises and organizations comprising them; associations with full economic and social unity of structural subunits; associations of the mixed type where some enterprises lose and others retain independence.

Agroindustrial associations of the first type are most prevalent in the food industry, particularly in canned-vegetable production. Let us examine their distinctive features on the example of Kherson Production-Agrarian Association of the Canning Industry. It was created in 1966 and made subordinate to the UkSSR Ministry of Food Industry. The association has three vegetable canning plants with a total production capacity of more than 250 million standard cans of canned products per year. The APO includes two specialized sovkhozes for growing vegetables whose area of land use amounts to 12,300 hectares.

Study of the organizational structure of production and management shows that the economic integrity in agroindustrial associations of comparable type is attained on a production-technology basis as well as under the impact of centralization of certain operational functions. Integrational processes here are aimed at the union of separate technological elements into a single production chain--from acquisition of raw materials to the output of finished products. Unified management of agroindustrial associations is based on organizational technological ties.

To what extent has actual rather than formal fusion of agricultural enterprises and vegetable-canning plants occurred here? It appears that the degree of agroindustrial integration in the associations can be quantitively expressed by referring the cost of products turn over for processing to its industrial production to the association's entire commodity production. This indicator was computed by us on the example of the production operation of the association during the years of the 10th Five-Year Plan. The cost of the association's commodity production for a year amounted on the average to 59,746,000 rubles, of which the cost of the vegetables that were processed equaled 9,702,000 rubles. In such a case the degree of agroindustrial integration of the entire production of the agroindustrial association would equal:

$$\frac{9,702}{59,746} \cdot 100 = 16.2 \text{ percent.}$$

At the same time, the share of agricultural production going into processing amounted to 63.5 percent. In this way the indicators show that an organized union of two spheres of production occurred at the agroindustrial association in one of which--agriculture--a deep level of intrabranch specialization was formed.

Although the level of integration is low in this APO, its organizational structure is quite complex. It has 8-9 structural elements. The complex organizational structure and territorial dispersion of the units of the associations result in the formation of many connections of various kinds among the units and operational levels. Thus Ovoshchnoy Sovkhoz has 7 sections, numerous production sectors, brigades, links, whose servicing and management are carried out by 9 basic services of this farm. The sovkhoz is operated on the basis of the territorial principle. Centralized management on the part of the APO is manifested here only functionally. In our opinion, the organizational composition and structure of management of this APO cannot be considered optimal. This is largely to be explained by a low level of agroindustrial synthesis as well as considerable territorial dispersion of the units. The maximum radius of transportation of raw materials from the association's sovkhozes is 48 km and from farms not included in the APO, 170 km. Consequently the necessity is quite obvious of expanding the association's own raw-material base through the addition of new sovkhozes to it. Moreover, possibilities should be looked into of creating a new agroindustrial association on the basis of a vegetable canning plant which is located at a distance of 150 km from the association. The question of centralization of the functions of management and of services as well as equalization of the levels of social-economic development of the labor collectives included in the association deserves to be studied.

An APO of the second type is characterized by a high level of collectivization of production, wide-scale use of direct ties and centralized organs of management. The operation of such associations is done as a rule by a central apparatus whose work is based on a combination of centralized management with operational independence and initiative of the units. Here the linear staff structure of management is clearly delineated--the top management of an enterprise is directly under the general director of the APO and in regard to functional operation--to his deputies. These principles are inherent in the organizational structure and are carried out in the activities of the administrative-managerial apparatus of all units, which to a definite extent excludes duplication and creates prerequisties for the effective accomplishment of the functions of management.

The planned process of development of production and social interconnections among the units of the APO determines the possibilities of further expansion of agroindustrial integration and leads to the appearance of mutual interest of the labor collectives of the different levels in the results of their labor. This is an important condition of optimal control over production and economic processes. It is natural for the expansion of agroindustrial synthesis to bring about structural changes in the operation of the APO. The centralized organs of management undergo development, which is attested to by increased outlays on their maintenance.[1] This does not mean, however, that centralized management in associations of this type results in deprival of the operational and economic independence of the enterprises as well as in a reduced role and responsibility of the bottom elements and subsystems of management. Any system of operation a priori presumes the existence of a certain degree of self-management byi the individual units (which does not obligatorily indicate their administrative independence).[2]

In the agroindustrial association of the mixed type, organizational and economic preconditions are displayed for combination of production and integration. It is characterized by variability of the organizational structure of production and the structure of the administrative apparatus. The forming of such associations is accompanied by expanded divison of labor, which finds its concrete manifestation in specialization of production. Furthermore, specialization serves as an important factor of development of production as it creates favorable conditions for its concentration, raising the level of technical equipment, which contributes in turn to growth of labor productivity and profitability. An example of this type of APO is the Odessa Fruit-Vegetable Canning Agroindustrial-Trade Association which possesses a multilateral direction of activity and a complex organizational structure. The agroindustrial association was created on a base of sovkhozes, industrial enterprises and trade organizations of the UkSSR ministries of sovkhozes, food industry and trade. It includes 20 sovkhozes with a total land-use area of 114,000 hectares, 3 canning plants with an annual capacity of 213 million standard cans, 3 retail-trade combines and 99 specialized stores. The association also had turned over to it a fruit and vegetable base, a special motor-vehicle base and

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1. See: "Agrarno-promyshlennyye kompleksy" [Agroindustrial Complexes]. Moscow, 1974, p 51.

2. See: "Problemy upravleniya sotsialisticheskim promyshlennym proizvodstom" [Operational Problems of Socialist Industrial Production]. Moscow, 1977, Vol 2, p 132.

a production control laboratory. The association's sovkhozes, enterprises and organizations are located in 6 rural and 7 city administrative rayons of Odessa Oblast and are dispersed over a large territory. As a result of the organizational and operational format of the APO, its structural units were turned over to the UkSSR Ministry of Food Industry and put under a single management in regard to operational activity. At the same time, all of them retained economic and juridical independence as cost-accounting organizations.

The sectorial principle has served as the basis for the setup of the administrative structure of the agroindustrial association. The direction of the 30,000-collective of the association's workers and employees is assumed by an administrative apparatus whose objective is to provide optimum management among the sectors. The combination of sovkhozes, enterprises of the processing industry and trade into one operational organ contributes to raising production efficiency and fuller satisfaction of the needs of the population for high-quality fruit and vegetable products.

Analysis of the organizational structure of the APO shows that subsystems function here, each of which has a sectorial affiliation and a multitude of its own subsystems structured on traditional organizational forms characteristic of the sector. The hierarchical levels of management here number 9-10, 6-7 of which are in the agriculture, processing-industry and trade subsystems. Economic disconnection, an absence of direct ties among the units and a weak development of the managerial system on the APO level attest to superficial economic ties to be found at the initial level of synthesis.

On the example of APO of the mixed type, the following principle is to be observed: the lower the stage of economic integration, the more complex the administrative structure of the associations. It has numerous levels for passing on operational information but lacks the traits of necessary specificity. Linear, functional, sectorial and territorial lines of coordination are interweaved in it. The organizational forms of such agroindustrial associations are not yet ready for the creation of an optimal operational structure on their base.

It should be noted that production efficiency in agroindustrial associations depends to a decisive extent on the degree that managerial activity reflects the developmental level of the productive forces and production relations among the associations' material-production sectors. Studies show that the organizational forms of agroindustrial associations under the influence of objective integrational processes significantly outstrip in their development structural changes in the administrative system. For the purpose of reducing the gap between the organizational production arrangement and the management structure of the associations, it is necessary to rationally centralize in them management, planning, distribution of funds of material stimulation and social development of the labor collectives, capital investment for the construction of production and cultural-everyday facilities, material-technical supply and also technical and transport services. A major responsibility for the accomplishmment of these functions is placed on the APO administrative apparatus whose work should be based on rational and effective subsystems of operation consequently, it is necessary to convert agricultural enterprises included in agroindustrial associations to the shop structure of operation and to reduce

segmentation of management in industrial enterprises engaged in processing raw materials. The introduction of an operative system of production management and the inauguration of a dispatcher service for associations have proved themselves.

The process of searching for and designing organizational forms for production asociations is a most important direction in the improvement of the management mechanism. The successful solution of problems arising along this route will become an important factor in raising effectiveness of agroindustrial integration and accelerate the realization of the USSR Food Program.

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TILLING AND CROPPING TECHNOLOGY

ROLE OF CHEMICAL PROGRAM IN FURTHER AGRICULTURAL DEVELOPMENT

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 11, Nov 83 pp 3-6

[Article by A. M. Artyushin, first deputy chairman of the Soyuzsel'khozkhimiya association: "Comprehensive Chemicalization of USSR Agriculture]

[Text] The 26th CPSU Congress, proposing a broad program for social development and improved public well-being, placed in the foreground the task of improving the supply of food products for the population. The USSR Food Program, approved by the May (1982) Plenum of the CPSU Central Committee, earmarked concrete goals which agriculture should reach by 1990. During the current decade the return from mineral fertilizers and other chemical substances used in agriculture is to increase by approximately 10-12 percent.

The results of the activity of the chemical service show that the direction developed by the party for improving the agrochemical service of the kolkhozes and sovkhozes has made it possible to considerable increase the volumes and to improve the quality of agrochemical work. The application of organic and mineral fertilizers through the efforts of Sel'khozkhimiya detachments had increased by 45 percent in 1983 as compared to 1980, the treatment of agricultural land with pesticides -- 1.5-fold, the liming of acid soils -- by 25 percent, the application of gypsum to solonets soils -- 1.7-fold, and the application of anhydrous ammonia -- 2-fold. Additionally, subdivisions of Sel'khozkhimiya annually add 4 million tons of lime materials and 70 million tons of peat. In 1982 ameliorative measures were conducted on an area of 1.2 million hectares, which is a one-third increase over the volumes of work in 1980. The amounts of work using agricultural aviation increased by 25 percent.

Still, life shows that the activity of the Sel'khozkhimiya association cannot be further improved without immediate solutions to a number of problems that are facing the branch. These include, first of all, the assimilation of capital investments that have been allotted, especially for construction and installation work for putting warehouse capacities into operation.

During 9 months of 1983 capital investments were assimilated by 97.91 percent, and for construction and installation work -- by 57 percent of the plan for the report period, or by 75.66 and 28 percent, respectively, of the annual plan. Moreover, the volume plan was fulfilled by only 58-68 percent by the

main contracting ministries and departments, and the startup of warehouse capacities in percentages of the plan amounted to: for the USSR Ministry of Rural Construction -- 44 percent, the Ministry of Transport Construction -- 33 percent, the Ministry of Construction -- 24 percent, the Ministry of Industrial Construction -- 19 percent, and Goskomsel'khoztekhnika -- 17 percent. As a result, as compared to the plan for the report period, the system as a whole failed to receive warehouse capacities for storing 216,000 tons of materials at the same time.

Many complaints are being made by contracting organizations against Goskomsel'khoztekhnika regarding questions of providing startup construction projects with equipment and materials. As of today, the startup of more than 20 bases and warehouses for chemical products is being delayed because of this reason.

Because of the poor supply of special technical equipment, the low technical level and the poor quality of a number of makes of machines, the effectiveness of agrochemical work has decreased. The shortage of loading and unloading equipment is the reason for the fact that the productivity of machines for applying fertilizers and chemical means for improving the soil has decreased by 25-30 percent.

The Sel'khozkhimiya association, which is responsible for the delivery of all agrochemical cargoes, is still, as a rule, being supplied with general-purpose trucks which are not appropriate for the cargoes that are shipped. The deliveries of trucks in 1983 amounted to 68 percent of the need for them, and 60 percent of the vehicles that were delivered were small ones.

A certain amount of work has been done to improve the technical condition of machines and mechanisms. The plan for fall and winter repair for the 1982-1983 period (9 months) was fulfilled by 116 percent for tractors, including for high-powered tractors -- by 108 percent, and for cargo trucks -- by 123 percent. But it should be noted that this fulfillment was achieved as a result of increasing the volumes of repair work performed by the Sel'khozkhimiya association. Enterprises of the USSR Goskomsel'khoztekhnika, as usual, are not providing for fulfillment of coordinated repair plans and are not providing for the repair of a considerable number of agricultural, loading and unloading, and warehouse machines, and also many kinds of equipment. The situation is especially unsatisfactory with respect to the machine and tractor fleet in Sel'khozkhimiya associations of the Kazakh, Turkmen, Tajik and Uzbek SSR's.

The agrochemical service has developed scientific fundamentals of the application of fertilizers and other means of chemization for all soil and climate zones of the country, and the optimal norms, time periods and methods for applying them. The fourth cycle of agrochemical examination of the soil is being completed. Fields have been certified on an area of 35 million hectares. Planning and technological documentation is being drawn up for all agrochemical work.

In search of ways for effective utilization of chemical means, the country is working for comprehensive agrochemical treatment of the fields. An accounting

done in 1982 showed that on these fields the productivity of winter wheat exceeded the average level achieved on the farms by 8.4 quintals per hectare, spring wheat -- by 10.9, potatoes -- by 44, and corn for silage -- by 130 quintals per hectare.

At the present time the agrochemical service has accumulated considerable volumes of information which is necessary for controlling plant nutrition and the fertility of the soil.

About 4,000 field experiments with fertilizers are conducted each year directly on the land of the kolkhozes and sovkhozes of the country. Their results are used to develop normatives for applying fertilizers and to determine the needs and distribution of supplies of them at various levels of administration of agricultural production. Since 1984 on 120 permanent sections located in various soil and climate zones of the country, the agrochemical service has been consistently keeping track of the changes in a number of indicators of soil fertility (humus, acidity, the content of mobile forms of phosphorus, potassium, magnesium, sulphur and trace elements).

On 385 farms of the country where weather stations are located, they annually do a comprehensive diagnosis of the mineral nutrition of agricultural crops, and the data are used for predicting the effectiveness of the application of mineral fertilizers.

A large amount of work is being done to control the quality of agricultural products and to protect the environment from the possible unfavorable effects of the chemical means that are applied.

In order to work on problems related to providing for maximum productivity of agricultural crops and effectiveness of the utilization of chemical means under production conditions, Sel'khozkhimiya associations are organizing rayon production-scientific centers for obtaining high yields and controlling the fertility of the soil.

The rayon production-scientific center is a new comprehensive system for the work of Sel'khozkhimiya associations, planning and research stations for chemization, and stations for protecting the plants and farms, which envision conducting the following work:

the introduction of progressive technologies for cultivating agricultural crops with minimal expenditures of manual labor;

comprehensive application of fertilizers, ameliorants, pesticides, retardants, growth regulators, and other chemical means;

control of the mineral nutrition of agricultural crops on the basis of methods of comprehensive diagnosis;

control of the fertility of the soil and the performance of work for comprehensive agrochemical improvement of the fields;

control of the quality of agricultural products;

protection of the environment from possible unfavorable effects of means of chemization.

In order to carry out the aforementioned work, the rayon Sel'khozkhimiya association concludes an agreement with the farm for a crop rotation with comprehensive application of chemical means on a particular field (section) with an area of 50-100 hectares, on the basis of the introduction of new technologies for the cultivation of agricultural crops. Here the association guarantees an increase in yields of 30 percent and more as compared to what the farm obtains throughout the entire crop rotation: a certificate of guarantee on an official form is issued for this commitment.

The volumes of work, coordinated with the oblast agro-industrial association, and also the list of farms included in the rayon production centers are approved by an order of the oblast Sel'khozkhimiya association.

All work in the rayon production centers is done by the farm and the Sel'khozkhimiya association on the basis of a collective contract, which provides for maximum interest of the workers in the final result of their activity -- the harvest.

The work of the center is organized in two areas: production and planning-research. The production part of the work is done by the rayon Sel'khozkhimiya association, and the planning-research part -- by the planning-research station for chemization and the plant protection station. When developing the technology for the cultivation of agricultural crops they can enlist oblast agricultural experimental stations and other scientific research institutions.

The planning-research work, necessary for substantiating the parameters that provide for a maximum return from the means of chemization that are applied, includes:

agrochemical examination in terms of an expanded set of indicators (24);

determination of the physical properties of the soil (texture, moisture content, volume weight, and so forth);

field experiments on comprehensive application of means of chemization;

registration and prediction of changes in the agrochemical properties of the soils;

diagnosis of the mineral nutrition of agricultural crops;

determination of the quality of agricultural products;

determination of the residual quantity of pesticides and other toxic substances in the soil and the plants.

In 1984 this work should be started in Ivano-Frankovsk, Chernigov, Kharkov, Kiev, Nikolayev, Lvov, Volyn, Moscow, Tambov, Lipetsk, Yaroslav and Grodno

oblasts, Krasnodar, Stavropol and Altay krays, the Tatar ASSR and the Lithuanian SSR.

The earmarked expansion and improvement of the application of chemical means in agriculture constitute a large reserve for implementing the Food Program.

In 1983 the TsINAO conducted an evaluation of the quality of the application of fertilizers by the remote method in 13 oblasts of the RSFSR and 4 oblasts of the Ukrainian SSR along the 40th meridian. A total of 216 administrative rayons and 9,021 fields were investigated. Fertilizers were applied to no less than 67 percent of the total area of fields. Losses of the grain yield on fields where fertilizers were not applied amounted to 2.3 million tons. Calculations show that in the USSR as a whole the grain not harvested for this reason amounted to 21-23 million tons.

The research showed that improving the quality of the application of fertilizers by aviation and ground equipment should become the general direction in the work of the agrochemical service. From the experience of the rayons where the quality of the work of ground equipment and aircraft is rated positively (4 points), one can see that the work for applying fertilizers can be carried out well, and with the utilization of existing technical equipment.

The practice of agricultural production of past years has convincingly shown that solving the most difficult problems of the crop growing branch depends on the introduction of industrial technologies for cultivating grain, industrial and feed crops. Against the background of the best strains, a high agrotechnical level of preparation of the soil, and the utilization of modern planting equipment, the possibilities of comprehensive chemization are disclosed. Even in 1980, despite the very unfavorable weather conditions, the yields of all agricultural crops cultivated according to industrial technology were 35-40 percent higher, and for individual crops -- 50-60 percent higher than with traditional agrotechnology.

In 1984 on an area of 20,000 hectares it is planned to utilize intensive technology for cultivating winter wheat and to obtain no less than 50-60 quintals of grain per hectare. Sel'khozkhimiya associations should play a leading role in solving this problem. To do this, even now it is necessary to conduct a diagnosis of the nitrogen nutrition, to provide for spring top dressing strictly in keeping with the recommendations of the agrochemical service, to organize the application of retardants and means of plant protection, and, in the southern regions of the country, to take measures for obtaining strong and durum wheats. This experiment is being conducted on relatively small production areas, but it will make it possible in the future to develop technologies for obtaining maximum yields under production conditions and to utilize more effectively the still insufficient resources of means of chemization.

In our country each year the grain lodges on an area of about 40 million hectares; winter grain crops freeze to death on 3-4 million hectares, and during hard winters, on 8-10 million hectares. In these conditions extensive application of growth retardants is a most important factor, which provides for reducing crop losses and increasing the effectiveness of fertilizers.

The need of agriculture for retardants (chlorocholine chloride, camposan) is being fully satisfied, but in 1982 these preparations were applied on an area of only 2.7 million hectares.

Unfortunately, industrial technology for the production of growth regulators intended for increasing the winter hardiness and drought resistance of grain and other crops is still developing slowly.

Domestic and foreign researchers have established the high effectiveness of the application of nitrification inhibitors to cotton, rice and other crops. They contribute to preventing the loss of 20-30 percent of the mineral nitrogen.

Under the conditions of intensive chemization of agricultural production, an important role is played by trace elements: boron, molybdenum, manganese, copper, zinc, cobalt and iodine.

The application of boron fertilizers to sugar beets provides for an average additional yield of 12 percent, and the application of molybdenum fertilizers to legume crops produces an additional yield of seeds of 13-31 percent and green mass -- 18-44 percent. It is most expedient and economical to utilize trace elements in the form of their salts as supplements to the basic fertilizers.

The work with organic fertilizers needs considerable improvement. Without their extensive application it is impossible to achieve a high return from mineral fertilizers. On an average for the country during the 10th Five-Year Plan, only 3.5 tons of organic fertilizers were applied to 1 hectare of arable land, and in 1982 -- 4.1 tons. The minimum need of the country's agriculture for organic fertilizers in order to provide for a complete balance of humus in the soil is 1.5 billion tons, or 7 tons per 1 hectare of arable land. Consequently, the volumes of application of organic fertilizers must be increased 1.6-fold. Because of this, their production should be placed on an industrial basis. This requires that all republics, krays and oblasts arrange for the construction of manure storage facilities and improve the fulfillment of assignments for producing peat.

Liming of acid soils is a decisive factor in increasing the effectiveness of farming. Because of increased acidity of the soil and the poor effectiveness of the application of mineral fertilizers to it, each year the country fails to harvest 17-18 million tons of agricultural products, translated into grain. But the elimination of excess acidity in the soil is taking place very slowly. Each year we fail to deliver the planned volumes of lime materials. As a result of this, the plans for liming are not fulfilled. There is an especially critical shortage of liming materials in the Russian Federation and the Ukraine.

Solonets and compound solonets soils have extremely unfavorable physical and chemical properties. The annual crop shortages from them amount to 10-15 million feed units. But the rates of reclamation of such land remain very low. The delivery of ameliorants did not improve in 1981-1983. Most of the underloading was at enterprises of the Ministry of Mineral Fertilizer Production.

Protecting the plants from weeds, pests and diseases occupies an important place in increasing productivity. It is time to eliminate the existing disproportion between the volumes of deliveries of fertilizers and the assortment and volumes of deliveries of herbicides and other means of plant protection. For this reason, during the years of the 10th Five-Year Plan the shortage of the crops amounted to more than 15 billion rubles.

The decreased effectiveness of mineral fertilizers was also brought about by the violation of the optimal ratios of nutritive substances. Taking into account the critical situation brought about by the inadequate quantity of phosphorous fertilizers, it is necessary to organize the production of phosphorite meal on the basis of local deposits. Working these could considerably increase the volumes of application of phosphorites.

It is also necessary to improve considerably the work of Sel'khozkhimiya associations for observing supply discipline. The realization of the planning estimates for comprehensive utilization of means of chemization which have been submitted to the farms depends completely on this. Unfortunately, in practice there are many cases of violations in pledging supplies of mineral fertilizers and other chemical means in terms of volumes, time periods and assortment.

Up to this point we have not completed the creation of an optimal structure for the agrochemical service, including scientific research institutions in it (it has been organized in its most complete form in the Moldavian SSR).

We have not earmarked principles for organizing joint work between the plant protection stations and planning and research stations for chemization. Rayon and farm comprehensive agrochemical laboratories are being created very slowly.

Agriculture is expecting from scientific institutes more concrete suggestions for further improving comprehensive technologies for obtaining maximum yields of agricultural crops. So far we do not have reliable models for controlling the fertility of the soil. Optimal parameters for diagnosing the nitrogen nutrition of the soil and a number of other scientific problems have not been developed for many zones of the country either. It is necessary to introduce completed developments more efficiently.

The solutions to all these immediate problems will undoubtedly make it possible to improve considerably the supply of food products for the population.

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PROBLEMS IN ORGANIZING PLANT PROTECTION PROGRAMS SET FORTH

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 11, Nov 83 pp 7-9

[Article by O. N. Prokof'yev, candidate of agricultural sciences, chief of the Kazakh republic plant protection station: "Problems in Organizing Plant Protection"]

[Text] The three years of work experience of the plant protection service in the Sel'khozkhimiya system make it possible to sum up certain results of its activity under the new conditions. To do this, the author conducted a sociological investigation by distributing an anonymous questionnaire among agricultural specialists of the republic. Answers were given by 92 percent of those questioned, among whom 45 percent were specialists in plant protection, 38 percent -- kolkhoz and sovkhoz agronomists, and 9 percent -- managers of rayon Sel'khozkhimiya associations.

To the question, "Are you satisfied with the work of the plant protection service?" 87 percent of those questioned gave an affirmative answer, including 82 percent of the plant protection specialists, 90 percent of the farm agronomists, and 100 percent of the managers of Sel'khozkhimiya associations.

Yet in recent years the service has repeatedly been subjected to criticism engendered by the position of the Sel'khozkhimiya association, which requires that all work be performed on the basis of autonomous financing. But many years of work experience of autonomously financed detachments for plant protection in various republics, including Kazakhstan, show that, with the existing economic relations between the farm and the contracting organization, and also with the existing methods of planning and material stimulation of autonomously financed organizations that serve agriculture, autonomous financing in plant protection inevitably leads to a system of "preventive" treatments, which are conducted without taking into account the actual presence of pests, diseases and weeds on the fields. As a result, pesticides which pollute the environment are used unproductively, and the autonomously financed detachments receive unjustified incomes. It is no accident that in the RSFSR, for example, the profit of autonomously financed plant protection detachments is to be planned in the very smallest amounts, and all money received in excess of this minimum is be returned to the sovkhozes and kolkhozes where the work was done (Bel'chenko, V. M., "We the Farmers," ZASHCHITA RASTENIY, 1982, No 6, pp 2-6).

Such a method of mutual accounts has been used in Kazakhstan for many years, and each year mechanized plant protection stations have transferred millions of rubles to the farms. This alone shows convincingly enough the outlays of uncontrolled autonomous financing in plant protection and the economic harm caused to the farms under the guise of services.

One is convinced of the fairness of this assertion by the answers to the question, "On what kind of budget should the plant protection service be maintained: the state budget or autonomous financing.?" Of the 98 percent who answered this question, 70 percent were in favor of maintaining the service under the state budget, and 2 percent consider it necessary to have both state and autonomously financed plant protection organizations. One should emphasize the position of the sovkhozes and kolkhozes, 60 percent of which do not approve of the autonomously financed basis of plant protection, considering it economically disadvantageous for the farms.

To the third question, "Are you happy with the existing structure of plant protection?" -- 60 percent of those questioned answered in the affirmative, including 48 percent of the plant protection specialists, 75 percent of the farm agronomists, and 25 percent of the managers of Sel'khozkhimiya associations (5 percent of those questioned had not determined their attitude toward this question). Evaluating their answers, one can note that 52 percent of the plant protection specialists explain their dissatisfaction with the structure of the service by its position in the Sel'khozkhimiya system (managers of this organization consider the service's relative independence to be abnormal).

We are speaking about four plant protection organizations which actually exist at the present time: the state plant protection service of the Sel'khozkhimiya association, the state inspection for plant quarantine of the USSR Ministry of Agriculture, the service for specialization and prediction of the development and spreading of pests and diseases, which is financed through the union budget ad has the status of a corporate body, and, finally, the production plant protection service, which is under the jurisdiction of the production administration of the Sel'khozkhimiya association. If one adds to this the fact that the scientific production laboratory for predictions in departments interests has been transferred to the TsINAO and that the Ministry of the Fruit and Vegetable Industry is gradually forming its own plant protection service, the complete breakdown of the principles of unity and centralization becomes obvious.

One can consider the results of this departmental separation to be, for example, the rapid spreading in the past 2-3 years of the Colorado beetle, the mass propagation of locusts and the unsatisfactory fight against them, the weakening of control over the application of pesticides, the poor effectiveness of scientific research on plant protection, and a number of other negative phenomena.

As for the position of the Sel'khozkhimiya association, it is based on the need to create a unified agrochemical service. But it seems that unity consists not in levelling the various services, but in centralizing and specializing each subdivision. It is appropriate to compare this with the

armed forces in which, for example, the infantry joins together the tank, engineering, motor vehicle and other specialized units and subdivisions which have their own command, auxiliary units and subdivisions, but are joined into a unified whole by centralized leadership and common tasks.

In the Sel'khozkhimiya system the plant protection specialists have ended up being the lowest-paid category of workers, and, moreover, they have practically no material incentives. It is difficult to explain this, since in Kazakhstan, for example, in the volume of chemization work of the Sel'khozkhimiya association, the proportion of plant protection measures exceeds 80 percent. Even stranger in this respect is the latest reorganization, as a result of which the Alma-Ata city plant protection station began to be called the interrayon Sel'khozkhimiya association, which made it possible to increase wages 1.5-fold and to change the bonus system. But the station's production program remained the same, and 80 percent of its support comes from subsidies from the city for protecting decorative plantings. And the actually autonomously financed interrayon stations, whose mechanized detachments perform 10 times more work for plant protection directly on the sokhozes and kolkhozes, thus making a weighty contribution to the implementation of the Food Program, are deprived of the payments and material incentives that exist in the Sel'khozkhimiya association.

The significance of this in raising the level of production is shown by the fact that, because of violation of the principle of payment according to labor, in the past 3 years specialists have been leaving the plant protection service for other subdivisions of the association and other organizations. As a result, for example, in the RSFSR only 50 percent of the people working in plant protection have a higher agronomical education, and only 26 percent have a higher specialized education. The situation with personnel is no better in Kazakhstan and, probably, in other republic. With such a situation, can one really speak about professionalism and demand high-quality work from the plant protection service?

In order to provide a complete idea of the attitude of those question toward the problem under discussion, it will be of some interest to give their most typical added comments and suggestions. Almost 17 percent of those questioned, of whom 32 percent were plant protection specialists and 11 percent were farm agronomists, suggest introducing the position of a plant protection agronomist on each farm, and 8 percent suggested creating plant protection points and detachments on the farms. About 6 percent of those who responded to the questionnaire think that specialists of rayon plant protection stations "do not meet the requirements of the time." Approximately 15 percent of the specialists were in favor of retaining the independence of the plant protection service, and 20 percent think that a decision to transfer the plant protection service to the Sel'khozkhimiya system would be wrong. But this is not only the opinion of plant protection specialists. Only 25 percent of those who responded to the questionnaire agreed with placing plant protection stations directly under the jurisdiction of the Sel'khozkhimiya association, including 4 percent of the plant protection specialists, 30 percent of the farm agronomists, and all of the managers of Sel'khozkhimiya associations.

Thus the majority of those questioned were unequivocally in favor of retaining the centralized plant protection service which is maintained through the state budget. But this fact, in the author's opinion, should be taken only as a basis for further improvement of the plant protection service, the need for which is dictated by the ever increasing volumes of application of means of plant protection. Paying attention to the results of the sociological investigation, it seems necessary to have two forms of plant protection service in the country: state and production.

The first, in the form of the Main State Inspection for Protection and Quarantine of Plants of the USSR Ministry of Agriculture, with a network of scientific research organizations and plant protection stations with toxicology and biology laboratories and observation points for predictions, should be given the rights of nondepartmental state registration of the existence of pests, diseases and weeds on agricultural land, and also the utilization of pesticides. Its main task is to plan and organize the work (including measures for external and internal quarantine) for plant protection, and also to designate and regulate the conditions for the application of pesticides. The state plant protection service should be compelled to prepare for the farms scientifically substantiated plans and technological charts of plant protection, with an indication for each specific field of the time periods and the number of repetitions of treatments, the kinds of pesticides, the norms for applying them, and so forth. These charts and plans are especially necessary when cultivating agricultural crops with industrial technologies and when developing integrated plant protection systems. It is important for the station to guarantee the farms exactly the same or a certain additional yield if its recommendations are followed. This will make it possible to sharply reduce the area of chemical treatments, to reduce the expenditure of pesticides, to improve the environment, and also to provide for obtaining programmed yields.

The control-toxicology laboratory of the service should determine the residual quantities of pesticides and issue toxicological certificates which will serve as the only document for the right to sell fruit and vegetable products that are to be used fresh or unprocessed. Such control will make it possible to regulate the application of pesticides to a considerable degree, and also to prevent to possibility of using agricultural products that have toxic residues.

Even for large farms which have their own plant protection agronomists, it is very important to have a consultative form of service, a particular instance of which is the drawing up of technological charts, which were discussed above. The judgment of consultants who specialize in a particular area (these are usually highly qualified specialists with a great deal of work experience) is usually more objective, and the consultants are able to go more deeply into the essence of a given problem and see better the shortcomings and omissions which the farm workers have ceased to notice. This approach makes it possible to give an authoritative recommendation on almost any question of plant protection. Here it should be emphasized that the main indicator of successful work of this form of service is not only prompt provision of the farms with the necessary information about the existence of pests, diseases and weeds, but also the development of measures for fighting against them

which provide for the most effective and economical utilization of means of plant protection.

And it would hardly be expedient to have plant protection agronomists on every farm, where they frequently work in some other specialty. But the effectiveness of the proposed measure will depend completely on the size of the area for which the service is provided which is assigned to the station specialist and also on his material interest in the final result.

In Kazakhstan the staff normatives envision one plant protection agronomist for a farm with more than 15,000 hectares of grain crops, of 300 hectares of vegetable and melon crops, or 200 hectares planted in fruits and berries. On specialized farms, where the area planted in fruits and berries exceeds 500 hectares, there should be a position of senior plant protection agronomist.

But calculations show that it is sufficient to have a consulting agronomist for 20,000 hectares of grain crops and 2,000-5,000 hectares of other crops, under the condition that they hire temporary investigators during periods of mass development of plant pests and diseases, and also weeds. In this case, maintaining consulting agronomists will cost about one-third as much as is envisioned by the staff normatives, and will be no more expensive than maintaining even one plant protection specialist on the farm. In addition to this, the creation of a unified state service for protection and quarantine of plants will make it possible to considerably reduce administrative expenditures for the staff: in Kazakhstan alone -- by approximately 50-100 units, as a result of which it is possible to improve the service for the sovkhozes and kolkhozes.

But the basis of the production plant protection service should still be the intrafarm subdivisions of this service.

The existence of autonomously financed mechanized plant protection detachments in the Sel'khozkhimiya system would also be justified. If necessary, they could help the farms to conduct measures for fighting against pests, diseases and weeds. But these detachments should work strictly in keeping with the technological charts and under the supervision of a station consultant, who will evaluate the quality of the work and allow payment for it. Such a system will bring discipline into the relations between the farms and the contracting organizations, will make it possible to eliminate cases of "preventive" treatments, will increase the responsibility of autonomously financed detachments for the promptness and quality of their work, will reduce expenditures of labor and funds, and, on the whole, will produce a significant economic effect.

It is more complicated to solve the problem of wages and material incentives for plant protection specialists. Existing experience in providing incentives for workers of rayon stations shows that it is expedient to pay bonuses at the expense of the farms when plans for the production and sale of crop growing products are fulfilled by the sovkhozes and sovkhozes that are being served, under conditions envisioned for farm specialists. Additionally, it is necessary to take into account the number of treatments and the quantity of pesticides that are used according to the principle: the smaller the

quantity, the larger the bonus. In essence, such a system is an interbranch contract with payment in terms of the final result, which will also stimulate the interest of the partners.

In conclusion, it should be noted that to the question on the sociological questionnaire, "Do you think it necessary to create a unified service for plant protection and quarantine?" -- 85 percent of those questioned responded in the affirmative, including 92 percent of the plant protection specialists.

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IMPROVEMENT IN WORK OF PLANT PROTECTION STATIONS DISCUSSED

Moscow ZASHCHITA RASTENIY in Russian No 11, Nov 83 pp 4-5

[Article: "In Order to Improve the Work of Plant Protection Stations"]

[Text] The chairman of the All-Union Production Association for Agrochemical Service for Agriculture, N. F. Tatarchuk, has issued an order, "On Increasing the Effectiveness of the Work of Plant Protection Stations" (No 82 of 16 September 1983). In it he notes that an important factor in increasing the productivity of agricultural crops is prompt and high-quality performance of work for fighting against plant pests and diseases and weeds. This work is being done on a high organizational level in Krasnodar Kray, Volgograd and Bryansk oblasts of the Russian Federation, Cherkassy, Rovno and Kharkov oblasts of the Ukrainian SSR and in other republics and oblasts.

The rules for plant protection in the USSR determine the tasks of the state service. But in the practical work of the rayon, interrayon, oblast, kray and republic Sel'khozkhimiya associations there are violations of the existing guidelines. There is a tendency toward weakening of the functions of the state plant protection service and a loss of its specialization. State control is not adequately exercised over the implementation by all land users of measures from protecting the crop, and also over the storage, application and transportation of pesticides, especially in the Sel'khozkhimiya system.

There have been cases of unsupervised dispatch and delivery of pesticides to the kolkhozes, sovkhozes and other agricultural enterprises, without accounting for the need for them, as a result of which the preparations are not utilized on the farms, they are accumulated, they are stored for longer than the normative time periods, and they become unuseable. For this reason the farms have accumulated a significant quantity of preparations that are prohibited and unsuitable for application -- specialists at the Sel'khoskhimiya base for centralized destruction of them do not engage in accounting for and delivering them, and the work for burial and salvaging pesticides is being carried out extremely unsatisfactorily. A similar situation has arisen with respect to packaging that has been used for pesticides.

The control-toxicological laboratory (KTL) is not working as hard. Instead of controlling the quality of treatment of seeds, domestic and imported pesticides, and their active solutions, the laboratories are analyzing agricultural products to determine the residual quantities of preparations. In a number of republics and oblasts the KTL's are not provided with specialists, equipment or instruments. In the Uzbek and Turkmen SSR's such laboratories have not yet been created.

The proper amount of attention is still not being devoted to organizing plant protection work that is carried out through the efforts and means of the kolkhozes and sovkhozes, which comprises 80 percent of the special measures. There have been cases in which they are not promptly waging the fight against pests and diseases of plants, and also chemical weeding of the planted areas. Comprehensive plant protection systems are still not being introduced energetically, as a result of which there are losses of agricultural crops and deterioration of their quality.

Managers of Sel'khozkhimiya associations are not taking the proper measures for improving the activity of plant protection stations. Organizations of the plant protection service are not provided with means of transportation or laboratory and other equipment, and problems of providing housing for specialists of this profile are not being solved satisfactorily.

In order to increase the effectiveness of plant protection and eliminate losses of the crop from pests, diseases and weeds, the order stipulates:

1. Before 1 January 1984 the Sel'khozkhimiya associations of the union republics are to consider in their councils the condition and activity of plant protection stations and develop measures for increasing the effectiveness of their work; they are to include in the schedule of the Sel'khozkhimiya association of the union republic the position of chief of the oblast, kray (ASSR) plant protection station, and in the schedule of the oblast and kray (ASSR) Sel'khozkhimiya association the position of chief of the rayon (interrayon) plant protection station; they are to establish that the chief of the oblast or kray (ASSR) plant protection station is hired and fired by the chairman of the Sel'khozkhimiya association of the union republic in keeping with a report from the chairman of the chairman of the rayon association, with the agreement of the chief of the oblast or kray (ASSR) plant protection station; they are to consider it expedient to appoint as chiefs of the plant protection stations of the autonomous republics, krays, oblasts and rayons, the deputy chairmen of the corresponding associations; they are to recommend the creation of rayon stations in the rayons that are served by interrayon plant protection stations. They are to strengthen signalization and prognostication points and to organize them in each administrative rayon with intensive farming. They are to take measures for providing newly created rayon plant protection stations and signalization and prognostication points with qualified personnel and the necessary equipment and material and technical means.

2. Republic (union republic, ASSR), kray and oblast Sel'khozkhimiya associations are to be guided by the fact that the functions and tasks of

agencies of the plant protection service for agriculture have been determined by the Guidelines for Plant Protection in the USSR, approved on 29 July 1981; they are to forbid taking specialists from this service for work that is not related to protecting plants from pests, diseases and weeds; under equal conditions with the other subdivisions of the unified agrochemical service, they are to provide the republic (union republic, ASSR), kray, oblast and rayon (interrayon) plant protection stations and laboratories, signalization and prognostication points, and expeditions under their jurisdiction with allocations for capital construction (production premises, laboratories, biologicals manufacturing plants and other facilities), automotive transportation, laboratory equipment, instruments and the necessary materials, and for specialists of the plant protection stations -- they are to provide housing; they are to take measures for expanding the biological method of fighting against plant pests and diseases and weeds, and also increase the responsibility for efficient and effective utilization of pesticides in the zone of service.

3. They are to establish that the distribution of funds for chemical and biological means of plant protection and technical equipment for their application is carried out by the corresponding rayon (interrayon), oblast or kray (ASSR) plant protection stations and is approved by the chairman of the corresponding association; orders of the plant protection stations for exercising state supervision of the observances of rules for storing, applying and transporting pesticides and the technology for working to fight against plant pests and diseases, and weeds are mandatory for subdivisions of the association which has jurisdiction over the objects that are being supervised.

4. Sel'khozkhimiya associations are to inventory prohibited pesticides and those that are unsuitable for use (in their assortment) and packaging that has been used for them at Sel'khozkhimiya bases, to organize this work on the kolkhozes, sovkhozes and other agricultural enterprises, and to submit the materials to the Soyuzsel'khozkhimiya association before 1 January 1984.

5. The plant protection administration is to coordinate scientific research work on plant protection which is conducted by the TsINAO and scientific research institutes of this profile that are under the jurisdiction of Sel'khozkhimiya associations of the union republics.

6. The TsINAO in conjunction with the VIZR [All-Union Institute for Protection of Plants] is to be responsible for scientific and methodological guidance of the work of plant protection stations, points for signalization and prediction of the appearance and development of pests and diseases of plants, laboratories for diagnosis and prediction, and control-toxicology laboratories concerning questions of introducing comprehensive systems of plant protection, and the achievements of science and advanced practice; the development of predictions of the volumes of work for plant protection; control over the observance of regulations for the application of chemical means of plant protection, and the development of methods of calculating the weediness of fields and the determination of the needs for pesticides in various zones of the country.

7. The TsINAO in conjunction with the VIZR and the scientific research institutes for plant protection of the union republics must, within 3 months, develop and submit for approval normatives for the expenditure of labor and working time of specialists of rayon, interrayon, oblast, kray and republic (ASSR) plant protection stations, signalization and prognostication points, and specialized laboratories.

Control over the implementation of this order is the responsibility of the deputy chairman of the Soyuzsel'khozkhimiya association, V. I. Martynenko.

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FORESTRY AND TIMBER

KARELIAN SCIENTIST INTERVIEWED ON FORESTRY RESEARCH

Moscow SOVETSKAYA ROSSIYA in Russian 7 Dec 83 p 6

/Interview with N.I. Kazimirov, doctor of biological sciences, corresponding member of the All-Union Academy of Agricultural Sciences imeni V.I. Lenin and head of a laboratory for simulating biogeocoenosis at the Institute of Biology of the Karelian Branch of the USSR Academy of Sciences by M. Sokolov, Petrozavodsk/

/Text/ /Question/ Nikolay Ivanovich, everybody is aware of exactly what a forest is in the everyday sense of the word. But precisely what is the understanding held by scientists in this regard?

/Answer/ A forest is a complete biogeosystem consisting of many mutually related components. Our laboratory is engaged in studying a forest as a unified complex. Here it is necessary to take into account the climatic conditions -- precipitation, heat, illumination, properties of the soil, ground water levels and their flow.

/Question/ What have been the results of the studies carried out in the laboratory?

/Answer/ We developed a mathematical model for pine tree growth on sandy soil. Words cannot express all of the relationships involved and the work of establishing by means of formulas all of the objectively existing regularities and reducing them to strict mathematics is a complicated task. However, it is only on such a basis that an EVM /electronic computer/ can determine the growth conditions, for all practical purposes, for any pine forest on sandy ground in the European part of the USSR -- from Murmansk to the Black Sea.

/Question/ What brought about the need for such studies?

/Answer/ The state forest fund is constantly decreasing in size. The felling of timber continues and it is not being compensated fully by forest plantings. Land is being developed for agricultural purposes and construction is being carried out on an intensive basis. Meanwhile, the consumption of wood is increasing. The principal supplies of wood are presently located in remote regions, where procurement operations involve great expenditures. In addition, industry has a greater need for coniferous types of wood: spruce, pine trees,

cedar and fir trees and these are for the most part being cut down. The less valuable types -- birch and aspen -- are being left behind and their areas are being expanded.

/Question/ Your institute is located in the Karelian ASSR. What is the situation there?

/Answer/ The situation in the Karelian ASSR is typical. During the post-war years the timber supplies decreased by several times. Excessive fellings are being carried out on a systematic basis: at the present time, 14 million cubic meters are being procured and they are being replaced by only 5 million cubic meters of plantings. At such a rate, there will be mature timber for only 25 years.

It is here that some assistance can be provided in the form of mathematical simulation. Permit me to cite an example: over a period of two decades, the cropping power in agriculture increased by a factor of 3-4. In forestry it remained at the former level. Simply stated, we are taking from the forests as much timber as is being created by nature. By what means are increases being achieved in the cropping power of agricultural crops? Such results are being realized from the use of advanced agricultural practices, mineral fertilizers and land reclamation operations. These same methods can be employed in the forests using the recommendations embodied in our method.

/Question/ What is the most decisive and easiest path to pursue?

/Answer/ The problem of soils. Distinct from the lands employed in agriculture, forest soils are very poor and thus require priority attention. We addressed ourselves to this problem several years ago. Mineral fertilizers, mainly nitrogen fertilizers, were applied with the aid of aviation. The economic effect was as follows: 300 kilograms of nitrogen fertilizer furnish an increase of 20 cubic meters of mature wood per hectare. One such dosage lasts for 6-7 years.

/Question/ Are such methods being employed abroad?

/Answer/ They are being used by countries with limited forest areas and by other countries as well. Practically all of the forests in Finland, Sweden and Norway are being treated in this manner.

/Question/ Many discussions are taking place at the present time regarding the best method for felling timber -- selective or clear fellings. What is your opinion in this regard?

/Answer/ Many countries have converted over to selective fellings. Mature trees are being cut down and plantings carried out. But then, regardless of how strange it might seem, I tend to favor clear fellings in forests of an operational nature. Plantings carried out at a clear felling site -- this represents an ideal training ground for foresters, not to mention the economic advantages which become available here. Imagine for yourself: at one time there was a spruce forest and it was cut down. The scientists explained that pine trees would grow better on this soil provided the ground

water level was raised. Land reclamation work was carried out and planting work was begun simultaneous with fertilizers being applied. Such a forest, assuming observance of the scientific recommendations and based upon mathematical simulation, will produce a crop several times more rapidly.

/Question/ What are the prospects for your scientific studies?

/Answer/ Detailed experiments still remain to be carried out. Experimental plots must be established and the natural conditions changed to conform to the recommendations obtained. In addition, we will continue to work on simulating the behavior of other strains.

We are working in behalf of the future. Only a few minutes are required to cut down a tree, the growth of which required dozens of years. If we can succeed in reducing these periods by at least a factor of 2-3 on an industrial scale, then we will witness a true revolution in our timber industry.

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FORESTRY AND TIMBER

ITEM ON NEED FOR MODERN TIMBER TRACTOR ELICITS RESPONSE

Moscow EKONOMICHESKAYA GAZETA in Russian No 38, Sep 83 p 8

[Article by I. Matserenko, deputy director of technical administration of Minsel'khozmash [Ministry of Tractor and Agricultural Machine Building]: "About the Timber Industry Tractor." Reference item was published in JPRS 84398, # 1401, Sep 83 p 55]

[Text] In reflecting on the methods and technical means of more effectively assimilating timber raw materials resources, the general director of the Silava Scientific-Research Association, I. Iyevin', in an article entitled, "Work Place--the Forest" (EKONOMICHESKAYA GAZETA, No 32) noted the urgent necessity of manufacturing a modern tractor for the timber industry. In his opinion it would be most realistic to manufacture such machines in two standard sizes. One of them is the TL-28 with a self-propelled SSh-28 undercarriage.

The Minsel'khozmash agrees with this point of view.

To be more precise, test TL-28 tractors passed state acceptance tests with positive results last year. A decision to manufacture this tractor was formulated and confirmed. This year the Khar'kov Plant of Self-Propelled Tractor Undercarriages is manufacturing an adjustment lot of TL-28 machines for controlled testing under real operational conditions.

But we must keep the following circumstance in mind. Mass production of the SSh-28 undercarriage will begin at the plant in the future. Under such conditions the manufacture of tractors specifically for the timber industry (the demand for them does not exceed 10-15 percent of total output) is accompanied by a number of difficulties. For this reason problems related to the manufacture of the TL-28 and its equipping with newly-designed units will be dealt with in conjunction with the client--the USSR State Committee of the Timber Industry.

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WATER POLLUTION IN MOLDAVIA FROM LIVESTOCK COMPLEX WASTE

Kishinev SEL'SKOYE KHOZYAYSTVO MOLDAVII in Russian No 10, Oct 83 pp 59-61

/Article by T. Levchuk, senior engineer at the Kishinev Laboratory of TsNIIKIVR and D. Unguryanu, head of the Department of Water Supply and Sewerage at KPI imeni S. Lazo: "Effect of Livestock Complex on Natural Waters"/

/Text/ Approximately 50 percent of the overall number of hogs in the public sector and approximately 30 percent of the cattle are concentrated at large industrial complexes throughout the republic. They consume 40 percent of the overall volume of water used by animal husbandry farms.

A change in the technology for fattening cattle and the high concentration of cattle have brought about a change in the methods for removing livestock waste from production facilities and in the means for utilizing such waste.

The hydraulic method of manure removal is being employed at 75-80 percent of the complexes. Although this method ensures the rapid and reliable transporting of manure from production facilities, it also brings about a sharp increase in the volumes of manure waste water compared to the waterless methods of manure removal.

The principal method for disposing of manure waste water from livestock complexes is that of using it for land fertilization purposes. In the process, the decontamination and composting of the manure waste water is carried out and coarsely dispersed impurities are separated out. These impurities are subsequently dehydrated to a moisture content of 65-70 percent and decontaminated in clamps on concrete platforms for a period of not less than 3 months, after which they are applied to the fields. Meanwhile the liquid fraction is delivered to a storage pond where it is held for a period of 8 months, at which time it can be used for the watering of agricultural crops.

The capital investments for processing a cubic meter of waste water in accordance with this system amount to roughly 1.3 rubles and the cost for processing -- 0.22 rubles. This system is employed at complexes having a capability for fattening 54,000 swine annually.

At complexes having a capability for fattening less than 24,000 swine annually, use can be made of the mechanical system of manure removal. In this instance,

liquid manure with a moisture content of 93-94 percent is divided up into fractions and stored for an extended period of time, after which the liquid fraction is transported to the fields in water-carts. The storage of such manure without breaking down into phases and with subsequent transporting in water-carts for plowing purposes is also possible.

The processing and utilization of liquid manure at cattle complexes are being handled in a similar manner. Included in the structure of these installations are quarantine containers, a unit for mechanical separation or settling, storage containers for the liquid phase and fields for irrigation farming. However, irrigation does not guarantee complete protection of the waters against contamination by livestock waste waters, which to a considerable degree is the result of a lack of effective methods for decontaminating them.

A second trend in the processing of manure waste waters is that of thorough purification for the purpose of preparing the liquid phase for discharging into open reservoirs or for irrigation in limited areas. Here we have in mind a yield, for such a maintenance level in purified waste waters, of biogenic elements (nitrogen, phosphorus and potassium) wherein there will be no need for diluting the waste waters with pure water and they can be used fro irrigation in accordance with the norms for watering.

The discharging of purified waste water into reservoirs is encountered in those areas where it is impossible, for one reason or another, to allocate agricultural land for irrigation farming purposes.

Watering on limited areas is encountered when difficulties exist in obtaining pure water for the dilution of waste water or when the cost of an irrigation system is high owing to certain limitations or complications.

The thorough purification of manure waste water, just as in the previous instance, commences with the division into two phases using the mechanical method. Additional purification of the liquid phase is carried out as a rule using the biological method in single or multiple-stage air tanks, with pre-purification in biological ponds.

The capital investments for processing a cubic meter of waste water using this system amount to 2.7 rubles and the cost for purification -- 0.4 rubles.

Of the overall volume of livestock waste which forms at all farms in the republic, 82-83 percent is processed using the first system and 7-8 percent using the second system.

The effect generated by livestock complexes on water sources is dependent upon the type of purification and utilization and upon the method employed for removing the manure and decontaminating the livestock waste. The most dangerous situation exists when such waste enters directly (without purification) into reservoirs and water channels, since this causes intensive contamination of the water. Livestock waste contains large amounts of pathogenic microorganisms (salmonella, causative agents of botulism, helminth eggs) and organic and biogenic elements which are capable of contaminating

not only the sources of water but also soil and air and causing diseases in people and animals.

The livestock waste of Moldavia, in terms of the degree of contamination, is equivalent to the contamination caused by a population of 20 million people, or 50-60 percent of the contamination caused by the population and all branches of industry in the republic.

Livestock waste exerts a great influence on the natural waters in the Moldavian region. This derives from a high concentration of cattle in the republic and poor support in the form of water. There are only 30,800 cubic meters of local runoff per square kilometer of territory in the republic, whereas for the country as a whole -- 194,200 square meters. During an average water content year (50 percent of the requirement), the republic's water resources amount to 12.6 cubic kilometers and this is provided almost completely (11.53 cubic kilometers, that is, 93 percent) by tributaries from adjacent basins. According to our computations, during an average water content year and in a conversion for a cubic meter of water resources, approximately 3 liters of livestock waste water forms in Moldavia. The distribution of the livestock waste which forms, among the basins of the principal rivers, is extremely irregular, fluctuating from 0.6 (Dnestr River) to 19 (Botna River) liters per cubic meter of water resources.

A principal source of water contamination is the livestock waste which accumulates in various water reservoirs (as a rule, earthen), quite often created with the prescribed requirements being ignored. In addition to the manure storehouses and storage tanks for a volume of up to 3 million cubic meters, as called for in the plan, the republic's farms have additional earthen water reservoirs, the volume of which is on the order of 1.5 million cubic meters. Owing to periodic discharging from them (during over-filling of the reservoirs, seepage through dams), a change takes place in the hydrochemical and hydrobiological regimes of the water areas. Thus, as a result of a periodic discharge from the Faleshty Association of Kolkhozzhivprom into the Gyrlo Fishing Pond, the water acquired a noticeable manure smell (up to three points), it lost some of its transparency (1-3 cm) and it became enriched with organic substances (up to 150 milligrams per liter in a conversion for KhPK /chemical requirement for oxygen/, nitrogen and phosphorus (10 and 2 milligrams per liter respectively). Both a shortage of oxygen dissolved in the water and a fishkill were observed. Studies carried out by us established the fact that the waste waters of the Nisporeny Kolkhozzhivprom are lowering sharply the quality of the water in a nearby pond. Here, even during the winter, the number of saprophytic bacteria reaches 80,00 in 1 milliliter and bacillary forms -- up to 560 cells in 1 milliliter of water.

Special danger is posed by the accumulation of livestock waste in storage tanks located in gullies and ravines, with the volume of such storage tanks reaching 100,000-500,000 cubic meters. When atmospheric precipitation enters the storage tanks, a surface runoff occurs from the surrounding territory, the dams erode and there is a strong discharge of large quantities of highly concentrated waste water into the water sources.

Contamination of the environment by livestock waste occurs only when such waste is incorrectly stored or when the rules and norms for its use are not observed. Of the overall volume of livestock waste entering water sources, 20 percent consists of waste which was washed away from pasture and composting sites by atmospheric precipitation and 65-70 percent -- resulting from the overfilling of reservoirs and seepage through dams.

The irrigation norm is dependent upon the means employed for preparing the livestock waste waters, the methods used for removing the manure and upon the design solutions for the network, irrigation regimes and crop rotation plans. The computation of the irrigation norm is carried out based upon the crop requirements for the three principal nutrients (nitrogen, phosphorus and potassium). A low estimate of the area of irrigated farm fields compared to the computed figure results in the gradual accumulation of nutrients in the soil, an improvement in the soil as a result of silt deposition and also the withdrawal of organic substances and nutrients into the natural waters. Thus the withdrawal of nitrogen flucuates from 48 to 10 percent (depending upon the type of soil).

The results of sanitary-helminthological studies reveals that not one of the existing systems for purification and processing ensures complete dehelminthization or decontamination of livestock waste waters. And this means that their use for irrigation can lead to serious contamination of the environment by pathogenic microbes, viruses and the eggs of helminths. The latter can accumulate in the soil in large numbers and remain active for an extended period of time, posing a threat to both people and animals.

The health of humans is also seriously threatened by high concentrations of nitrates in the water consumed. The consumption of water having a high nitrate content (10 milligrams per liter) brings about pathological improvements in the organism of animals. A source of nitrates can be not only high irrigation dosages for the fields using livestock waste waters but also the washing away of such waters from the fields by atmospheric precipitation. As a result, the nitrates with infiltration waters can reach underground waters and those with surface runoff -- exposed water areas.

Complete biological purification of waste waters is employed at swine-raising complexes. As a rule the planned degree of purification is not achieved and, as a result, 2-5 percent of the livestock waste entering water sources represents contamination discharged from insufficiently purified waste waters. In the process, a deterioration takes place in the sanitary state of the water areas.

Thus, when insufficiently purified waste water from the Bul'bokskiy Swine-Raising Complex (KhPK = 150-200 milligrams per liter, suspended substances = 300-400 milligrams per liter) was discharged into the Byk River, the overall content of organic substances increased, defined according to the KhPK as being up to 40 milligrams per liter and the content of difficult to oxydize organic substances was raised. This is borne out by an increase of almost threefold in the bacillary forms of bacteria lower than the discharge of the waste waters. The overall number of bacteria engaged in protein decomposition increased by a factor of 2-3.

The protection of the environment, including natural waters, against contamination by livestock waste must include a complex of measures associated with the distribution of livestock complexes, the utilization and processing of livestock waste and the use of effective manure removal methods.

The livestock complexes must be located at a proper distance from natural water areas and populated areas and the construction of production facilities and grazing areas in floodplain regions must be eliminated.

The processing and purification of livestock waste waters requires the use of more acceptable methods for ensuring the maximum removal of suspended substances from the waste waters. This makes it possible to regulate the principal fertilizing portion of the manure. The sediment obtained in the process serves as rich organic fertilizer. It is utilized in a more efficient manner than unprocessed liquid manure.

Such methods include first of all the methods of mechanical purification (installations for the mechanical breaking up of the manure). The development and study of methods and installations which make it possible to intensify the clarification of the waste waters (thin-layer settling, flotation and so forth) are efficient from this standpoint.

The maximum removal of coarsely dispersed impurities from livestock waste waters makes it possible to ensure the biological purification of waste waters, which in this instance requires less expenditures. Thorough biological purification furnishes such advantages as more complete removal of nutrients compared to physical-chemical and other methods and an increase in the norms for watering. Improvements in the biological purification system for the purpose of organizing a circulating technical water supply for the hydraulic removal and transporting of farmyard manure are deemed advisable, since they make it possible to reduce considerably the overall consumption of water by the livestock farms (by roughly 12-13 million cubic meters annually).

The agricultural use of livestock waste can and must be carried out only when the waste waters are properly prepared (decontamination, dehelminthization when required, biological purification and so forth) and when the regimes and schedules and also the norms for applying organic fertilizers are observed in a strict manner.

It is our opinion that in Moldavia, where the population density is very high, the use of the soil method for the utilization and decontamination of livestock waste waters must be limited.

Special attention should be given to the storage and composting of livestock waste. The composting sites should be properly equipped and the schedules for the biothermal treatment of livestock waste and for its use for fertilization purposes should be observed.

The most promising methods and installations for the processing and utilization of livestock waste, from the standpoint of environmental protection, must be developed and introduced into operations. This applies to those methods which make it possible to withdraw maximum quantities of nutrients from the manure

for use in the creation of secondary feeds. Interest is also being displayed in the use of a solid sediment as a nutrient medium for hatching the larvae of flies.

The intensification of agricultural production has required an expansion in the complex of measures carried out earlier aimed at protecting the environment against livestock waste. In Moldavia, a republic with a high population density, a high concentration of livestock and also limited water resources, the protection of natural waters against contamination by livestock waste is of special importance.

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